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KELLAWAY (Charles H.) & EADES (T.). **Field Notes on the Common Australian Venomous Snakes.**—*Med. Jl. Australia.* 1929. Aug. 24. 16th Year. Vol. 2. No. 8. pp. 249–257. With 1 text fig. & 18 figs. on 4 plates.

This is an instructive lesson, well illustrated by figures, in the identification of the venomous land snakes, and particularly of the six commonest and deadliest species, of Australia, the authors emphasizing the fact that for the proper treatment of snake-bite it is essential that the snake that inflicted the bite should be accurately identified. The six species are the Tiger snake (*Notechis scutatus*), the Death adder (*Acanthophis antarcticus*), the Copperhead (*Denisonia superba*), the Black snake (*Pseudechis porphyriacus*), and two species of Brown snakes (*Diemenia textilis* and *D. nuchalis*). In each case, besides the technical specific diagnosis upon which exact identification depends, the size and general appearance, the habitat, the habits and mode of life and behaviour, and the details of the distribution of the species are given. There are many other species of venomous snakes in Australia, the authors estimate the number, including the venomous sea-snakes, as about 100, and give a few words to some of them, as well as a key to genera.

A. Alcock.

KELLAWAY (C. H.). **Observations on the certainly Lethal Dose of the Venom of the Death Adder** (*Ancanthophis* [*sic*] *antarcticus*) **for the Common Laboratory Animals.**—*Med. Jl. Australia.* 1929. June 8. 16th Year. Vol. 1. No. 23. pp. 764–772. With 2 graphs in text. [6 refs.] [Walter & Eliza Hall Inst., Melbourne.]

This paper gives in full detail the effects, as observed in symptoms and post-mortem observations, of the venom of the Australian Death adder (*Acanthophis antarcticus*) on horses, monkeys, cats, rabbits, guineapigs, rats, and mice. The experiments confirm those of previous observers as to the highly toxic character of the venom and its comprehensive neurotoxic, haemorrhagic, and haemolytic properties. It is not coagulant, but, on the contrary, exhibits a feeble anticoagulant action. The subcutaneous certainly lethal dose of the venom for the different species of animals in experiment lay between 0·025 and 0·7 mgm. per kilogram of bodyweight, and the subcutaneous-intravenous index varied from 2·5 to about unity.

A. A.

KELLAWAY (C. H.). **The Action of the Venoms of the Copper-Head** (*Denisonia superba*) **and of the Death Adder** (*Ancanthophis antarcticus*) **on the Coagulation of the Blood.**—*Med. Jl. Australia.* 1929. June 8. 16th Year. Vol. 1. No. 23. pp. 772–781. [19 refs.] [Walter & Eliza Hall Inst., Melbourne.]

This interesting paper starts with a review of previous work on coagulant venoms—venoms characteristic of vipers, but otherwise known only in a few elapines (and those Australian), which when injected intra-venim in sufficient doses cause intravascular coagulation. The experiments here fully described show that the venoms of *Denisonia superba* and *Acanthophis antarcticus* even in large doses have no coagulant action *in vivo* in birds and mammals, though they have a feeble coagulant action in high concentrations on avian and mammalian plasma *in vitro* ; that with Lamb's technique (using citrated and oxalated plasma) both these venoms have also a feeble anticoagulant action on mammalian plasma *in vitro*, an anticoagulant activity that is not destroyed, but rather is enhanced by heating ; and that (in preliminary experiments) both venoms, when permitted to act in high concentrations on mammalian plasma *in vitro*, impair its subsequent reaction with coagulant venoms.

A. A.

KELLAWAY (C. H.) & WILLIAMS (F. Eleanor). **The Venoms of** *Oxyuranus maclennani* **and of** *Pseudechis scutellatus.*—*Australian Jl. Experim. Biol. & Med. Sci.* 1929. Sept. 16. Vol. 6. Pt. 3. pp. 155–174. With 5 text figs. [8 refs.] [Walter & Eliza Hall Inst., Melbourne.]

This paper contains the details of a careful experimental study of the venoms of two species of Australian Elapine snakes—*Oxyuranus maclennani* and a species presumed to be *Pseudechis scutellatus.* [It is interesting to note as another authentic illustration of the fact that preserved snake-venoms keep their virulence that the samples of venom here studied had been collected in the field several years before.] The important facts are, respecting the Oxyuranus venom, that it is lethal to rabbits in subcutaneous doses of the order of 0·5 mgm. and in intravenous doses of 0·1 mgm. per kilo of bodyweight, that it is powerfully neurotoxic and causes death by failure of respiration, that it contains thrombase and causes intravascular clotting when injected in sufficient dosage, and that it is feebly haemolytic. The venom of the species presumed to be *Pseudechis scutellatus* is lethal to rabbits in subcutaneous doses of the order of 2 to 3 mgm. and in intravenous doses of about 0·7 mgm. per kilo of bodyweight, and it is feebly neurotoxic but powerfully anticoagulant and haemolytic. Both venoms have a stimulant action on isolated plain muscle.

A. A.

KELLAWAY (C. H.). **The Action of Australian Snake Venoms on Plain Muscle.**—*Brit. Jl. Exper. Path.* 1929. Oct. Vol. 10. No. 5. pp. 281–303. With 9 text figs. [11 refs.] [Walter & Eliza Hall Inst., Melbourne.]

The venoms of certain Australian Elapine snakes studied by the author have a powerful stimulant action upon plain muscle *in vitro* of a type which the author thinks to have not been described before, either for snake-venoms or for any other substance. The species so far tested give in various concentrations the reaction described : *Notechis scutatus* (tiger snake), *Acanthophis antarcticus* (death adder),

Denisonia superba (copperhead), *Pseudechis porphyriacus* and *guttatus*, *Oxyuranus maclennani*, *Diemenia textilis*.

The following are the author's conclusions :—

" 1. All the Australian elapine venoms tested have a stimulant action upon isolated plain muscle.

" 2. The type of action resembles the anaphylactic reaction of the isolated plain muscle of the guineapig in its latent period, and in the ease with which the muscle is desensitized by the venoms of this group.

" 3. The Australian venoms produce the reaction in varying concentrations. After reaction to one venom the plain muscle is insensitive to equivalent doses of the other venoms in the group.

" 4. The muscle after desensitization does not recover its sensitiveness to snake venom, but its reactions to other stimuli are unimpaired.

" 5. The plain muscle of guineapigs sensitized by the injection of egg albumin, after desensitization with snake venom, retains unimpaired its sensitiveness to its specific anaphylactic antigen. After desensitization with egg albumin the muscle appears to be somewhat less sensitive to snake venom.

" 6. Experiments with ergotoxin suggest that the effect of the venoms is a direct one upon the plain muscle.

" 7. The venoms cause contraction of the isolated uterus of the rat, and the reaction of the plain muscle of the guineapig and rabbit is therefore not due to the production of histamine, since this drug causes relaxation, not contraction, in the uterus of the rat.

" 8. The reaction differs from that caused by the toxin of *Vibrion septique*, and after desensitization with snake venoms a good reaction can be obtained with this toxin.

" 9. The behaviour of the only two other venoms tested (those of *Naia tripudians* and *Vipera russelli*) is quantitatively widely different from those of the Australian elapines.

" 10. The stimulant principle in the Australian venoms is moderately thermo-labile, and is destroyed at 92°–94° C. at about the same rate as the neurotoxic principle.

" 11. Like the neurotoxic principle, it appears to reside in the proteose fraction of the venom.

" 12. At pressures of 300 to 400 mm. of mercury, and during a period of some hours, it only passes with difficulty through pyroxylin filters permeable to erythro-dextrins but not to egg albumin or haemoglobin.

" 13. The stimulant principle is neutralized by antivenine, but the results obtained by titration, using the isolated plain muscle, are quantitatively widely different from those obtained by subcutaneous injection in guineapigs.

" 14. Death-adder and tiger-snake antivenines give some protection against Australian venoms other than those against which they are prepared, and non-specificity of the same order is observed in tests with the isolated plain muscle."

A. A.

MacPherson (John). **The Largest Venomous Australian Snake.** [Correspondence.]—*Med. Jl. Australia.* 1929. May 4. 16th Year. Vol. 1. No. 18. p. 609.

Mentions, by the name *Oxyuranus maclennani*, two venomous snakes, 9 feet 2½ inches and 8 feet 6 inches long respectively, killed in Cape York peninsula, and refers to another venomous snake, *Demansia* [? *Diemenia*] *guttata*, over 9 feet long, killed in the Northern Territory.

A. A.

VELLARD (J.). Acções phylacticas não especificas em relação aos venenos ophidicos. Tratamento auxiliar dos accidentes ophidicos. [**Specific Drugs in the Auxiliary Treatment of Snake-Bite.**]—*Inst. Oswaldo Cruz, Supplemento das Memorias.* 1929. July 31. No. 9. pp. 156–165. French summary p. 166. [23 refs.]

The author has experimented with the effect of various drugs upon the venom of certain snakes. In one series of experiments he injected the drug with the venom after they had been in contact together for some time up to an hour, and in another series he injected the venom an hour *after* the injection of the drug. In the latter series of experiments, using the venom of *Crotalus terrificus* 0·002 mgm., of *Lachesis jaracara* 0·10 mgm., and of Cobra 0·10 mgm., he got the following results: Spartein 15 mgm. was completely protective against *Crotalus terrificus* and alleviative of the symptoms of the cobra venom; strychnin ·04 mgm. completely protective against *Lachesis jaracara*; adrenalin ·05 mgm. completely protective against *L. jaracara* and cobra, and alleviative of *C. terrificus*; pilocarpine 20 mgm. completely protective against cobra; cafein 20 mgm. completely protective against *jaracara* and cobra; manganese chloride completely protective against cobra. Morphin, atropin, cocain, digitalin, oil of camphor, and alcohol had no protective effect. From the practical standpoint, the author thinks that the drugs shown to have a protective action may have a subordinate value in the treatment of snake-bite.

A. A.

CLARK (H. C.). **Abstracts of Snake-Bite Cases. Central American Divisions—United Fruit Company, 1928.**—*Seventeenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1928. pp. 271–287.

——. **Snakes from the Chiriqui Land Company.**—*Ibid.* pp. 288–289.

——. *Bothrops nummifiera* **in Honduras.**—*Ibid.* pp. 289–291. With 2 figs.

i. These brief abstracts, though of local value as a record, are not of wide general interest, since in more than half of the 46 cases the snake was either not caught at all or not identified. In 12 cases the species was identified as *Lachesis atrox* ("barba amarilla," or "fer de lance"), in 2 cases as *L. schlegelii*, and in 1 as *L. mutus* (bushmaster). Five cases were fatal—1 *atrox*, 1 *mutus*, and 3 unidentified. It may be of interest to know that, where the site of the bite is recorded, 20 bites were on hand or finger, 6 on wrist or forearm, 1 on shoulder, 10 on foot or toe, 2 on leg, and 1 on thigh.

ii. Of 78 snakes collected in Chiriqui territory (western extremity of Panama) 52 were *Lachesis atrox* (fer de lance), 7 were *L. schlegelii* (horned palm-viper), 1 was *L. mutus* (bushmaster), and 1 was a coral snake (*Elaps nigrocinctus*)—the rest being non-poisonous though supposed by the collectors to be poisonous.

iii. *Lachesis nummifer* (=*Bothrops nummifera*) is known in the vernacular of Honduras as *mano de piedra* and *timbo*.

A. A.

JACKSON (Dudley). **Treatment of Snake Bite.**—*Southern Med. Jl.* 1929. July. Vol. 22. No. 7. pp. 605–607.
CRIMMINS (M. L.). **Poisonous Snakes and the Antivenin Treatment.**—*Ibid.* pp. 603–605.

These two papers are concerned with the venomous snakes of the United States of America—which, but for two apparently scarce species of coral snakes (Elaps), are all Crotaline vipers. The papers will be instructive for the local readers, but contain nothing for those who are familiar with the classical work of the great American physiologist Weir MITCHELL on snake-venoms and of his successors in France, India, Australia, and South America.

A. A.

TAYLOR (K. P. A.). **Apparent Cure of Purpura Haemorrhagica with Bothropic Antivenin.**—*Seventeenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1928. pp. 194–196. [United Fruit Co. Hosp., Quirigua, Guatemala.]

The patient here was a white man, age 21, who had been ill for 7 days, with a high temperature and a diagnosis of fulminating typhoid fever, or alternatively "grippe"; on the 4th day severe epistaxis, unrelieved by horse-serum, calcium chloride, and ergotin, had necessitated fore and aft tamponage of nares. When admitted to hospital bleeding from nostrils and gums was abundant, and besides numerous purpuric patches at the sites of cuppings and hypodermic injections there was one spontaneous purpuric patch to establish the diagnosis of haemorrhagic purpura; subsequently there was vomiting of blood, haematuria, and bleeding from the bowels, and since drugs, including adrenalin, had no effect, transfusion of blood seemed to be the only means of saving life. During preparations for the operation Dr. H. C. CLARK suggested bothropic antivenin, and 10 cc. were injected into a muscle. "Clinical cure was nearly instantaneous;" within 2 hours the epistaxis, which at one time had been "spectacular," had stopped; and the patient was discharged on the 13th day after the beginning of his illness. Two weeks later the patient, as the result of a gunshot, had to have a toe amputated and the operation was done without any unusual bleeding. He was under observation for about 20 days after the operation.

A. A.

BUDDLE (R.). **Poisonous Snakes found at the Singapore Base.**—*Jl. Roy. Nav. Med. Serv.* 1929. Oct. Vol. 15. No. 4. pp. 280–289. With 3 text figs.

This useful paper is intended for naval medical officers on the China Station who are likely to be calling at Singapore and are not likely to be provided with standard treatises on snakes and specific treatment of snake-bite. The local poisonous species described and instructively discussed are the common oriental Cobra, the King Cobra, the banded Krait (*Bungarus fasciatus*), the "coral" snakes *Doliophis bivirgatus* and *D. intestinalis*, and the pit-vipers *Lachesis purpureomaculatus* and *L. wagleri*. The author thinks that the local cobra is not as deadly as its Indian match. [The impression that individuals of the selfsame species, notoriously deadly in India, are much less virulent in the more generally humid climate of Further India is not at all new; but, so far as the reviewer is aware, it has never been subjected to conclusive tests.]

A. A.

NICHOLLS (Lucius). **The Identification of the Land Snakes of Ceylon.**—*Ceylon Jl. Sci.* (Sect. D. Med. Sci.) 1929. Oct. 28. Vol. 2. Pt. 3. pp. 91–157. With 12 plates.

Here are alternative schemes for the specific identification of the land snakes of Ceylon without reference to skeletal (cranial) characters or main stress on dentition : one of them is based chiefly upon colour-markings and general appearance ; the other chiefly upon disposition of scales and shields.

A. A.

KOPSTEIN (F.). **Observations on the Venomous Effect of** *Naja bungarus.*—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1929. Vol. 18. No. 2. pp. 304–309. With 1 text fig.

——. Waarnemingen over de gifwerking van *Naja Bungarus.*—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1929. June 10. Vol. 69. No. 6. pp. 559–564. With 1 text fig.

This is an interesting story of a snake-charmer who took his pet snake, a king cobra (*Naia bungarus*), to the river for a bath and got bitten in the wrist. By report he died in convulsions three-quarters of an hour afterwards. The author quotes several cases recorded in British India, where death followed even more rapidly. The author describes the snake as an obviously starved specimen. Both fangs were intact, the left venom-gland was dry, but the right yielded about one-third of a cubic centimetre of venom when milked. This venom was diluted with 4 times its volume of glycerine, and 0·5 cc. of the mixture was injected at the root of the tail of a full-grown *Macacus cynomolgus*. The animal showed the usual symptoms of gradually increasing drowsiness and paralysis, and expired in asphyxic convulsions in 26 minutes. " Some drops " of the mixture injected into a hen were fatal in 6 minutes. To doses of 0·2 cc. of the mixture a tortoise succumbed in an hour and a half and two freshwater snakes in 8 hours.

A. A.

FRASER (Laurence). **A Case of Snake-Bite in Cyprus.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Nov. 25. Vol. 23. No. 3. p. 315.

The snake in this case was *Vipera lebetina*, and the victim was bitten on the forehead when stooping to drink from a pool. Seen eight hours afterwards, the man was semi-conscious but in great pain, and there was much local oedema, extending to the face and neck and chest, occluding the eyes and obstructing speech and deglutition. At night he was delirious. Next day the only trouble noted is much hawking of mucus and blood for eight hours. On the third day there was ecchymosis of the eyelids and throat and on the abdomen and penis, but the eyes were freed, as also was speech and swallowing. The bite was treated by incision and dry $KMnO_4$, and the patient by strychnine, adrenalin, oil of camphor, and rectal injection of saline solution. The local wounds healed slowly, but without suppuration, and the patient was discharged on the 12th day.

A. A.

OTTO (R.). Untersuchungen ueber die Wirkung verschiedener Schlangengift-Antisera auf das Berus-Kreuzottern-Toxin. [**Observations on the Efficacy of Different Antivenenes against the Venom of** *Vipera berus.*]—*Ztschr. f. Hyg. u. Infektionskr.* 1929. Oct. 12. Vol. 110. No. 3. pp. 513–515. [1 ref.] [Robert Koch Inst., Berlin.]

This is another confirmation of the discovery of KRAUS and MORITSCH that certain anticrotaline serums of the Butantan (Brazil) Institute neutralize the venom of the European *Vipera aspis*, and it also confirms the author's observation that the Butantan polytropic antiophidic serum neutralizes the venom of *Vipera berus*, although coming something short of the ER serum of the Pasteur Institute in this respect.

A. A.

VELLARD (J.). Toxicité des venins ophidiques par voie nasale. [**Toxicity of Snake Venom by Nasal Way.**]—*C.R. Soc. Biol.* 1929. Nov. 4. Vol. 102. No. 28. pp. 418–419. [Bios Inst., Nictheroy, Brazil.]

Summaries of experiments on the application of venom of *Crotalus terrificus* and of *Lachesis jaracara* to the intact nasal mucosa of guineapigs, and demonstrating the mortal results.

A. A.

VELLARD (J.) & DE ASSIS (A.). Immunologische Untersuchungen ueber das Gift brasilianischer Anurenarten. [**Immunological Investigations on the Venom of Brazilian Anura.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 63. No. 1/2. pp. 116–138. [31 refs.] [Vital Brazil Inst., Nictheroy.]

This is a paper for the specialist. The authors have investigated the venomous cutaneous secretions of some South American tree-frogs and toads, and find that in only two free-frogs, namely, *Phyllomedusa burmeisteri* and *Trachycephalus nigromaculatus* is it haemolytic. The details of the paper are concerned with the effects of the venom on the red cells of sheep, and with antigens and complement-fixation properties.

A. A.

VELLARD (J.). Propriétés des sécretions cutanées de quelques rainettes des environs de Rio de Janeiro. [**Properties of Skin Secretion of Tree Frogs at Rio de Janeiro.**]—*C.R. Acad. Sci.* 1929. Apr. 15. Vol. 188. No. 16. pp. 1064–1066.

This paper gives a full account of the venomous secretions of the skin-glands of three species of the tree frogs (Hylidae) of Brazil. The secretion is easily obtained by shaking up the little animals in a little distilled water or normal saline. That of *Hyla albomarginata* is toxic to pigeons, causing general muscular convulsions and opisthotonos, from which the birds always recover. That of *Trachycephalus nigromaculatus* and that of *Phyllomedusa burmeisteri* are highly toxic to all classes of land vertebrates, as also is the parotid secretion of the latter species, all being both neurotoxic and haemolytic. The particular symptoms and post-mortem appearances are described at some length.

A. A.

PAWLOWSKY (E. N.) & STEIN (A. K.). Experimentelle Untersuchung ueber die Wirkung des Actiniengiftes (*Actinia equina*) auf die Menschenhaut. [**Experimental Observation of the Effect of Sea-Anemone Venom on the Skin.**]—*Arch. f. Dermat. u. Syph.* 1929. May 20. Vol. 157. No. 3. pp. 647–656. With 5 text figs. [Numerous refs.] [Military Med. Acad., Leningrad.]

The authors describe, with assiduous attention to minute detail and with numerous text-figures, the nettle-cells and the ectodermal glands of the sea-anemone and their pathological effects upon the skin—local inflammation, oedema, extravasation and infiltration. They also give abstracts of numerous experiments illustrating the clinical effects.

A. A.

DUHIG (J. V.). **The Nature of the Venom of "Synanceja horrida" (the Stonefish).**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 62. No. 3/4. pp. 185–189. With 2 text figs. [7 refs.]

The venom of *Synanceia horrida*—a well-known Scorpaenoid fish in warm seas, usually on rocky bottoms—is secreted in cutaneous sacks attached to the spines of the dorsal fin. It is neurotoxic and haemolytic;

in the author's experiments 0·03 mgm. injected subcutaneously into 300 gm. guineapigs caused paralysis of the diaphragm and legs; and 0·047 mgm. completely haemolysed 0·2 cc. of a 3 per cent. emulsion of guineapig cells in an hour, at 37° C.

A. A.

i. TROISE (E.). Action du venin de l'Araignée *Latrodectus mactans.* [**Action of the Venom of the Spider** *Latrodectus* [*sic*] *mactans*].—*C.R. Soc. Biol.* 1929. Vol. 102. No. 36. pp. 1097–1098. [1 ref.]

ii ——. Spécificité du sérum anti-*Latrodectus mactans.* [**Specificity of Anti-***Latrodectus* [*sic*] *mactans* **Serum.**]—*Ibid.* 1098–1099. [1 ref.]

i. This rather scrappy paper is confirmatory of and supplementary to the author's earlier paper noticed in this *Bulletin,* Vol. 26, p. 278. One of the most characteristic symptoms produced in experimental animals by *Lathrodectes mactans* venom is a state of general convulsive tremor, which is exaggerated by dividing the medulla.

ii. The author has prepared a protective anti-Lathrodectes serum, and has proved its efficacy against Lathrodectes venom. He has also experimented with its action on the venoms of two other species of spiders, namely, *Lycosa raptoria* and *Ctenus nigriventer.* The Lycosa venom causes only a local reaction. The Ctenus venom injected into the peritoneum causes dangerous symptoms. He finds that Lathrodectes antiserum is not protective against the venoms of these other two species, and, vice versa, that neither anti-Lycosa serum nor anti-Ctenus serum neutralize the venom of Lathrodectes.

A. A.

BELLINI (Enzo). Sull'avvelenamento da morso di vipera.—*Policlinico.* Sez Prat. 1930. Feb. 3. Vol. 37. No. 5. pp. 177–180.

LABORATORY REPORTS.

GOLD COAST. **Annual Report of the Medical Research Institute, Gold Coast, from 1st April, 1927, to 31st March, 1928** [RUSSELL (H. M.)].—*Gold Coast Rep. on Med. & San. Dept. for Year Apr., 1927 to Mar., 1928.* IX. Scientific pp. 46–57. With 3 figs. on 1 plate.

This report relates to the laboratories at Accra and Sekondi. During the official year 1927–28 the Accra institution co-operated with members of the Rockefeller Commission in studying the histology of experimental yellow fever in *Macacus rhesus*; hundreds of animals were used and over 1,000 sections examined, and the work was still proceeding at the end of the year. Sixteen (3 doubtful) cases of yellow fever came to post-mortem examination; leptospira was not found in any of them. Work on plague included vaccine tests on *Cricetomys gambianus*, search for variants of *Past. pestis*, and experiments on a previously observed loss of virulence in passage through partially immunized animals. Contrary to earlier experience, strains that had been in culture for six months or more were found to have become much attenuated; by a single passage through *C. gambianus* virulence was restored fully for that species, considerably for *rattus*, but not appreciably for guineapigs, and all attempts to enhance virulence for guineapigs by successive passage failed. In respect of variants of *Past. pestis*, distinct differences in the appearance of colonies were observed, but they bore no relation to salt stability or virulence. Of experiments planned to produce attenuation of virulence by passage through vaccinated animals, two were successful, and confirmed the results reported last year. In 107 post-mortem examinations 26 neoplasms were examined, of which 16 were malignant (4 carcinoma, 12 sarcoma). The usual statistics of examinations of faeces, blood, etc., and of cognate routine are recorded. *Past. pestis* was not found in any of the 1,279 rodents examined. Among examinations of animals attention is directed to a newly imported polo pony with trypanosomes in the blood, a dog similarly affected, a positive diagnosis of anthrax in a cow, numerous cattle dying in Labadi district and showing blood-films positive for Babesia, and a plague-like septicaemia in *Cricetomys gambianus*. The report from Sekondi gives the routine statistics without particular comment. The report of the Medical Entomologist gives some preliminary details of a tsetse-fly survey of cattle-routes.

A. Alcock.

ANNALES DE LA SOCIÉTÉ BELGE DE MÉDECINE TROPICALE. 1928. Dec. Vol. 8. No. 3. pp. 251–272.—Rapport sur le fonctionnement du Laboratoire de Léopoldville et des services annexes pendant l'année 1927. [**Leopoldville Laboratory Report for 1927.**]

The chief point of interest here is the annual record of the results of treatment of trypanosomiasis in man with tryponarsil, Hoechst 2754, and Fourneau 270.

Tryponarsil, which is prepared by the Brussels firm of Meurice, is described as an odourless, white, crystalline powder with the same formula and constitution as tryparsamide. It is easily soluble in water,

and it keeps well in the tropics if isolated and protected from heat, sunlight, and damp. Solutions should be made at the moment of use, and any solution that is not clear should not be used. It is said to be remarkably penetrative in its action upon the nervous system, as indicated by the cerebrospinal fluid, and also to act as a stimulant; and it is quickly eliminated. The usual dose for an adult is 2 gm. a week, up to a total of 50–100 gm. for a course. The present record relates to 149 chronic cases where the drug was given intravenim in amounts per individual case ranging from 20 to 122 gm. Of these cases, in 77 the cerebrospinal fluid became quite normal, with a corresponding clinical improvement; in 36 the leucocyte rate became normal, but the albumin remained in excess; and in 22 the leucocyte rate to some extent diminished. (The local standard for a normal cerebrospinal fluid is a leucocytia below 5 leucocytes per cmm. of fluid and an albumin rate not exceeding 25 cgm. per litre.) On the other hand, 12 of the 149 cases succumbed to trypanosomiasis during treatment with tryponarsil, and in two cases treatment was interrupted by the supervention of visual troubles.

Treatment with Hoechst 2754 has been continued. Eleven chronic cases which received individual doses varying from 18 to 42·5 gm. are here reported. Two were cured, lymphocytosis was diminished in six, two died, and one escaped observation.

Further trial of Fourneau 270 shows it to be fully as trypanocidal and as penetrative as tryparsamide and tryponarsil. Of fourteen chronic cases treated, seven were cured, the leucocyte and albumin rates of the cerebrospinal fluid returning to normal. The total amounts given individually in these successful cases varied from 22·5 gm. to 56 gm. in weekly injections, usually of 1·5 gm. increased in two cases to 2 gm. A great reduction of leucocytosis and albumin occurred in another case after 48 gm. In two other cases visual troubles occurred after 4·5 gm. and 11·5 gm. respectively. One case died.

The reporters observe of plasmochin that it dispels all phases of *Plasmodium malariae* from the blood, and also the crescents, but has no effect upon the schizonts of *P. falciparum.*

A. A.

ANNALES DE LA SOCIÉTÉ BELGE DE MÉDECINE TROPICALE. 1929. June 30. Vol. 9. No. 2. pp. 123–157. With 2 figs. [6 refs.] —Rapport sur le fonctionnement du laboratoire de Léopoldville-Ouest et des services annexes pendant l'année 1928. [**Work of the Leopoldville Laboratory in 1928.**]

The report contains the usual statistics. In the anti-trypanosomiasis campaign 10,720 persons were examined; and in the trypanosomiasis hospital 290 inmates were treated, of whom 91 were discharged as apparently cured. In the tuberculosis infirmary there were 82 patients; new-born infants to the number of 141, as well as 25 recruits, were vaccinated against infection. In the treatment of trypanosomiasis "269 Fourneau" and "417 Fourneau" were tested. Of those put under "269" treatment, one, in the early stage of the disease, continued sterile as to blood, with the cerebrospinal fluid normal and the weight increased, for two months after receiving 13 gm.; and in two others, in the late stage, the blood was sterilized and the cerebrospinal fluid reverted to normal lymphocyte and albumin ratios after 28 gm. and 42 gm. respectively—in successive courses consisting each of 1 gm. daily

for 4 days. Of those treated with "417," one was a chronic case, in which, after 48 gm., the blood was sterilized but the cerebrospinal fluid remained profoundly altered; the other two were early cases, and in one of them parasites reappeared in spite of a total dosage of 20 gm., while in the other parasites reappeared after 4 gm. had been received but the blood remained sterile after 12 gm. The drugs in question were given by the mouth. "Goyl," a new proprietary drug from the Belgian firm Meurice, tried in the treatment of yaws was found to be comparable with stovarsol; and "chardyl," a new drug, of the same origin, for dysentery, to be comparable with yatren. Of typhoid fever, unknown in Leopoldville before 1927, it is said that natives are less susceptible to infection than Europeans, but suffer more severely. Antilarva measures on a small scale have been found to be of little use in the local attempts to control malaria. Sixty-eight persons—medical, sanitary, and religious—took the laboratory course in the diagnosis and treatment of the prevalent endemic diseases.

A. A.

KENYA, Colony & Protectorate of: **Annual Report of the Medical Research Laboratory for the Year 1928** [KAUNTZE (W. H.), Deputy Director of Laboratory Services].—*Kenya Ann. Med. Rep. for Year ending 31st December, 1928.* pp. 101–129. With 4 figs.

This report summarizes the work of separate sections of administration, serology, vaccination (calf lymph), pathology, medical zoology, medical entomology, and biochemistry. It is mainly a record of diligent routine. Laboratory routine, however, in any new-settled country, is a valuable if not spectacular species of research, particularly when facilitated by well-trained, trustworthy, and assiduous laboratory attendants. It is a complaint of this report, however, that the native African attendant is deficient in the quality of assiduity and may throw up his work at a day's notice. Attendants of that sort, some of whom, moreover, have not ambition enough to learn to write, are hardly entitled to the dignified appellation of "laboratory assistants."

The following items are of general interest; but it must be understood that the results of much work that is distinctly purposive research are not published in this report. A comparison of various different methods of separating worm-eggs from faeces awards the first place to the CLAYTON LANE flotation-centrifugation method, and a similar comparison of methods of investigating protozoa is decided in favour of simple centrifugation with saline. An interesting scrutiny of the deposits that may accumulate in native finger-nails revealed, in 15 out of 50 occupants of the local jail, eggs of worms, chiefly threadworm and tapeworm, never ascaris, and not any cysts. A hookworm census of a typical coast community showed a 100 per cent. infection. The section of medical entomology reports continued observations of seasonal occurrence, house-frequency, natural infectivity, breeding-places, and effects of control of anopheline mosquitoes, and the continued filling-in of borrowpits in Nairobi. Rat-flea and field-rodent surveys are still in progress. Cordylobia attacks have been rather frequent among Europeans in Nairobi. In the biochemical section the influence of the addition of calcium carbonate and bone-flour to a prison hospital diet has been studied, and retention of calcium has been verified by examination of faeces; other problems of nutrition are in course of investigation.

In the pathological record 51 cases of malignant tumour in native Africans appear—31 carcinoma and 20 sarcoma. In 7,992 examinations of faeces for intestinal parasites only 2,136 were negative. Multiple infestations were common, in a few cases running up to six species in one host. The species identified are *Ancylostoma duodenale* in 2,343 cases, *Trichuris trichiura* in 2,269, *Taenia saginata* in 1,729, *Ascaris lumbricoides* in 1,591, *Strongyloides stercoralis* in 340, *Schistosoma mansoni* in 317, *Oxyuris vermicularis* in 32, *Hymenolepis nana* in 11, *Schistosoma haematobium* in 3, Heterophyes in 1 ; *Entamoeba histolytica* in 78 cases ; other species of amoebae in 888, *Giardia intestinalis* in 65, and other species of flagellates in 65. In blood examinations for malaria parasites *Plasmodium falciparum* was disclosed in 1,082 cases, compared with 121 cases of *P. malariae* and 42 of *P. vivax*.

A. A.

TANGANYIKA TERRITORY. **Annual Report of the Medical Laboratory Dar es Salaam for the Year ending 31st December, 1927** [CLEARKIN (P. A.).]—32 pp. With 1 map & 1 graph. 1928. Crown Agents for the Colonies, 4 Millbank, London, S.W.1. [2s. 6d.]

This Report, more than half of which is contributed by the entomologist, is full of matter, but mostly of local interest. Of 316 helminth infestations observed in 459 specimens of African faeces, 294 were Ancylostoma. Of 49 specimens of African urines, 46 contained *Schistosoma haematobium*. Of 128 African sputa, 44 were infected with the tubercle bacillus. Five cases of sarcoma and 5 of carcinoma were identified microscopically in Africans, 2 of the latter being in the male breast. Five cases of lymphatic leucaemia were identified in Africans. The common anophelines are *A. gambiae* (=*costalis*) and *A. funestus* (*A. mauritianus*, *A. squamous*, and *A. pitchfordi* have also been noticed). *A. gambiae*, which is fairly catholic in its tastes, has been found breeding in a roof-gutter of a European house, but its larvae were detected in only one out of more than six thousand crab-holes examined. Both *gambiae* and *funestus* are described as "domestic species" of the native quarter of Dar-es-Salaam, where of 127 of *gambiae* collected, 26 were found infected with malaria, and of 165 *funestus* collected, 17 were infected. An examination of the children in the native quarter showed that nearly all of them had malaria parasites in the blood.

A. A.

EGYPT, Ministry of the Interior. **Department of Public Health. Annual Report of the Public Health Laboratories for the Year 1927.**—29 pp. 1929. Cairo. Govt. Press.

Of the 29 pages of this report 18 are descriptive, and these deal for the most part with matters of laboratory organization and routine work. Investigation of molluscan intermediary hosts of Bilharzia has been continued, and it has been found that infection of pond-snails is exceptional in the winter months. A new intermediary host, *Planorbis mareoticus*, has been added to the list. In a village in the Dakhla oasis, having as its sole water-supply an artesian stream rife with *Bullinus contortus*, operations [not fully described] for destroying these snails seem to have been successful. An [unspecified] apparatus was devised to deliver automatically into the stream so much copper sulphate as should maintain the water at a strength of 5 parts of the

salt per million. No living snails could be found at examinations made 6 and 10 months afterwards. At the same time infected inhabitants of the village were subjected to a full course of antimony treatment. Arrangements for an ancylostomiasis survey were completed during the year, and trial of a new anthelminthic, tetrachlorethylene, were made, the results of which are to be published. At the Antirabic Institute 2,868 patients appeared, of which about half were sifted out as superfluous, and 1,638 had the complete course of treatment. Of these, 6 died during treatment, 6 died within 15 days of their discharge, and 5 died more than 15 days after discharge.

A. A.

SERGENT (Edmond). Rapport sur le fonctionnement de l'Institut Pasteur d'Algérie en 1928. [**Report of the Algerian Pasteur Institute for 1928.**]—*Arch. Inst. Pasteur d'Algérie.* 1929. Mar. Vol. 7. No. 1. pp. 121–150. [43 refs.]

This interesting report is shared in equal parts by subjects of special research and statistics of routine work. The research section includes an instructive disquisition on the methods practised locally for the abatement of malaria—by regulation and drainage of stagnant waters, by regular use of quinine to exhaust the reservoirs of infection in man, and by mechanical protection supplemented by technical instruction of the population. Studied attempts to prepare a convenient and efficient vaccine against Oriental sore have not achieved success. Antituberculous vaccination of new-born infants has been actively practised; the results followed up in 208 cases tend to establish the efficacy of B.C.G. vaccine. Recent observations confirm the impression that the amount of endemic tuberculous infection is small. The study of fungous skin-disease is continued. A third case of infestation by *Fasciola hepatica* has been discovered—in a European. Research has shown that the Algerian fixed virus of rabies used in the preparation of vaccine has lost much of its virulence without detriment to its immunizing quality; 1,278 persons completed prophylactic treatment, the mortality being 0·39 per cent.; the offending animals in 1,114 cases were dogs, and in 114 cases cats, the small remnant including, in numerical order, rat, ungulates, human victims, jackal, ferret, hare, mouse and monkey.

A. A.

SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH. **Annual Report for the Year ended 31st December, 1928** [LISTER (F. S.).]—87 pp. With 2 charts & 1 plate. 1929. Johannesburg.

The doings of the Research Division fill 28 pages, and of the Routine Division (which also contains original quanta), 43 pages of this Report.

In the Department of Bacteriological Research two types of *Past. pestis* have been separated in culture and distinguished as S and R—S being virulent, efficient as a prophylactic, and producing on inoculation an efficient therapeutic serum, but tending the longer it is kept under culture to change to the R type, which is negative in the three properties specified. The study of an epizootic among Namaqua gerbilles associated with a Pasteurella organism similar in morphology, in culture characters and in staining reactions to *Past. pestis*, but pathogenically different (since the disease could not be transmitted either by culture or

by blood to rats and guineapigs, and not invariably to Lobengula gerbilles from Johannesburg, though transmissible to half-grown rabbits and to Lobengula gerbilles from Cape Town), has introduced an element of ambiguity into the early diagnosis of a rodent epizootic. A study of the practical value of bacteriophage against plague is judicially adverse —since for obtaining immunity 4 or 5 injections are required, and for treatment even a strain of high virulence is inconstant and erratic in its effects. Cultivation of bacilli from tuberculous lesions of various kinds proves quite conclusively that the bacillus in native South African infections is exclusively of the human type. An analysis of 350 cases of declared tuberculosis in native miners points in the great majority to an initial lesion in the tracheo-bronchial glands, not in the apex of the lung. A new excitant of hay fever has been discovered in the pollen of *Prosopis julifolia*, a leguminous tree of the Mimosa suborder; and three more cases have occurred to support the view that the antibodies from grass pollens may have their specific limitations. Interesting studies of the pneumococcus have shown for certain groups that certain specimens in tissue and in blood-culture, carefully dried and stored, have retained life for 11 and 8 years respectively. A varied search among local sources for a bacteriophage competent against the commoner pathogenous micro-organisms has disclosed from typhoid stools one active against the dysentery group of bacilli; from activated sludge one strongly active against the dysentery group and *B. paratyphosus* A; and from flies one potent against the dysentery group and *Past. pestis*. (The original contributions of the Departments of Parasitology and Entomology have been published elsewhere and previously noticed here.) In the Department of Pathological Research work was continued on tumour-cells and on the subject of local immunity. In the latter study rabbits were submitted for definite terms, at different intervals, to a spray of suspensions of dead or living pneumococci; subsequently their lung-tissue was cultivated, and the culture-medium was found to have in a high degree the power of agglutinating pneumococci.

In the Routine Division the aggregate of specimens, etc., dealt with was 90,197, of which 70,326 related to bacteriology. In the Bacteriology Department a classification by blood-groups was made of volunteer blood-donors enrolled for the necessities of the local general hospital. A case of undulant fever was discovered in a farmer in whose stock a prior outbreak of contagious abortion had occurred. The therapeutic value of bacterial filtrates was studied, and was found to be good—rapidly so in the case of erysipelas. In certain small outbreaks of pneumonia in native mines, clinically not quite typical, the bacteriology showed an influenza followed by a purely streptococcal infection of the lungs. In the routine of pathology 5,489 specimens were examined and 430 autopsies were conducted. Carcinoma was found in 13 native autopsies. Observations are summarized of a case of chordoma of the clivus. Cases of appendicitis caused by Bilharzia are noticed. In the routine of parasitology (7,852 specimens) evidence of amoebic infection occurred in 15 per cent. of 1,739 specimens of excreta examined, and of *Schistosoma mansoni* in 26 specimens. *S. haematobium* was found in 172 urines. In the Vaccine Department evidence is accumulating of the prophylactic efficacy of oral administration of typhoid vaccine.

The Report, full of instruction and well printed, is worthily and conveniently garbed like an ordinary paper-covered book—in most grateful contrast to the awkward customary foolscap livery.

A. A.

MAURITIUS. **Annual Report of the Bacteriological Laboratory for the Year 1927** [BARBEAU (L. G.), Supt. Bact. Lab.].—*Mauritius Ann. Med. & San. Rep. for the Year ending 31st December, 1927.* pp. 14–23.

The number of samples examined in the bacteriological laboratory was 8,062. The intestinal parasites observed in 911 specimens of faeces were, in order of abundance—of protozoa, *Entamoeba histolytica, Giardia intestinalis, E. coli*, Trichomonas, *Chilomastix mesnili*, Enteromonas, Cercomonas; and of worms, Trichuris, Ascaris, Hookworm, Strongyloides, Oxyuris (4), and Davainea (1). Blastocystis occurred in nearly one-fourth of the samples and is believed, locally, to be the cause of a chronic and relapsing diarrhoea, characterized by profuse, gassy, and sometimes glairy and blood-stained stools, and accompanied with flatulence and tenderness of the belly. Blastocystis infestation is wide spread among the local poultry and is believed to be pathogenous to them; it also occurs in a common toad of recent introduction. Sixteen cases of malignant tumour were verified during the year.

CALMETTE's antituberculosis vaccine is in considerable demand and has been used this year for 1,546 infants and 400 new-born calves. The original culture was brought from Paris, and is maintained locally in accordance with Calmette's technique, and fresh vaccine is prepared for use at least once a week. A special report on the preparation and preservation of cultures and of vaccine emulsions is annexed.

A study of the pH of the local anopheline breeding waters has been made. *A. gambiae* (=*costalis*) and *A. maculipalpis* breed in alkaline or faintly acid waters; *A. funestus* breeds in waters that are on the acid side. A search for the intermediary host of *Schistosoma haematobium* has been carried through 1,670 pond-snails—*Limnaea mauritiana, Melania tuberculata*, and "*Paludina vivipara*"—but without success, although other species of cercariae have been discovered, which are the subject of a detailed description and illustrated report. Among the human tumours examined was a vaginal growth containing eggs of the Schistosoma and a growth in the brain containing objects suggestively like those eggs.

A. A.

MADRAS. **Report of the King Institute of Preventive Medicine Guindy for the Year ending 31st March 1928** [KING (H. H.), Director].—pp. 32+3. 1928. Madras. [8 annas.]

The burden of this report is the great increase in routine work, particularly in the manufacture of cholera vaccine, for which there was an enormous demand and a total output of 727,000 cc.; the vaccine is reported to have given good protection. The consumption of other stock vaccines—typhoid in particular—was increased also. The number of primary antivariola vaccinations was 1,330,470, with a case success-rate of 96·9 per cent. and an insertion success-rate of 89·2 per cent. It is noted that the best yields both in quantity and quality of pulp were obtained from calves in the 3 months December-February. Among the interesting items recorded under clinical bacteriology is a comparison (1,140 instances) between the Wassermann and the Kahn tests, in which several Wassermann-negatives were observed to be definitely Kahn-positive, while very few Kahn-negatives were strongly

Wassermann-positive. Another interesting item is the cultivation from a bit of tissue from a case of suspected gas-gangrene of an organism of the Welchi group which was mortal to guineapigs and produced gas at the site of inoculation, and yet was aerobic. The report for the section of public health consists of details of routine work in connexion with water-supplies of municipalities and railway-stations, food-stuffs, and purification of water and sewage. Among original investigations must be noticed a house-to-house study of human filariasis in the town of Saidapet. Here of 1,164 persons examined 16·3 per cent. were found infected, and of 1,741 female *Culex fatigans* 34 per cent. This interesting study is now being pursued from the pathological and therapeutic standpoints.

A. A.

BOMBAY. **Report of the Haffkine Institute for the Year 1928** [SOKHEY (S. S.), Offg. Director].—43 pp. 1929. Bombay: Government Central Press. [Annas 2 or 3d.]

Much of the report is occupied with official details, a general review of the activities of the institute and tabular matter relating to routine examination, prophylactic treatment for rabies, and vaccine output. It is interesting to learn that the biochemical department of the laboratory has started work on the establishment of standards applicable to Indians enjoying good health. Western health standards are likely to differ considerably from these. A large number of blood analyses have already been carried through in regard to standards for non-protein nitrogen, uric acid, creatinine, phosphates, cholesterols, fatty acids and the plasma proteins—fibrin, globulin and albumin. Standards of blood-cell counts and haemoglobin are also being worked at.

Anti-plague enquiries are referred to in some detail. It was found that *Past. pestis* is one of the few Gram-negative achromogenic aerobic bacilli to give a positive nitrite reaction. Another peculiarity of the plague bacillus is its greatly improved growth on blood agar and this fact, as well as the positive nitrite reaction, have formed additional tests for purity of plague cultures. Much controversy has arisen over the possibility of transmission of plague by certain species of fleas and on the possibility that this may explain the immunity of certain localities from plague. In the careful experiments now carried out it seems evident that successful transmission can be effected by means of *Xenopsylla astia* and *X. brasiliensis* as well as by *X. cheopis*. Parallel experiments have been done with a plague antiserum and a plague bacteriophage. It was found that a rabbit immune serum administered intravenously 24, 48, 72, 96 and 120 hours after infection gave mortality rates of 0, 9, 29, 32 and 33 per cent. respectively. In the case of the bacteriophage, which could bring about lysis of a culture in 2 hours, the corresponding rates were 50, 69, 60, 70 and 85·7. Untreated control mortality rates varied from 81 to 89 per cent. A short paragraph states the results of experiments on the duration of immunity in rats surviving experimental infection with virulent plague bacilli. The intervals used were of 30, 60, 90, 120, 150, 180, 210, 240, 270, 300 and 360 days. These rats were still completely immune to fresh infection, "at the end of 300 days from the date of the original infection." After 330 and 360 days the mortality is about 19 per cent.

Enquiries on maternal mortality in childbirth are being vigorously pursued along certain definite lines. The most important of these is on the so-called anaemia of pregnancy which is not regarded as a true pathological entity. "The macrocytic anaemia, evidently quite common amongst the women in Bombay, is made worse by the strain of pregnancy." Tentatively the view is expressed that this type of anaemia is very likely to be a deficiency disease. Investigation into the blood changes in osteomalacia, which is a comparatively common disease in India, have rather unexpectedly shown low inorganic phosphate values with only slightly reduced calcium values. Further observations too have been made into the age of primiparae in India. The average age of those watched in Bombay hospitals was 20·5 years. Of the 1,112 cases, 12 per cent. were below 16 years of age, and the youngest was 14 years of age.

Investigations were continued into the type of bacilli causing surgical tuberculosis. It had been previously found that 40 cases of cervical adenitis, 8 of axillary gland tuberculosis and 17 of pulmonary disease all furnished strains of human type. Now one single case of cervical glands has provided the first instance to be recorded in which a bovine tubercle bacillus has been found to cause human tuberculosis in India. Many experiments are being carried out to determine the non-pathogenicity of B.C.G. tubercle vaccine. "Specific lessions are observed in the lungs of rabbits after intravenous inoculation with B.C.G. when death takes place within a few days after inoculation, but they are regressive, and tend to disappear after some time." Other experiments to test the value of the vaccine as an immunizing agent are in progress. Transformation experiments of one type of tubercle bacillus into another are among those which are being undertaken.

W. F. Harvey.

ASSAM. **King Edward VII Memorial Pasteur Institute and Medical Research Institute, Shillong. The Twelfth Annual Report for the Year ending 31st December, 1928** [MORISON (J.)].—38 pp. 1929. Shillong. [1s. 8d.; Re.1–1.]

This report treats mainly of the activities of the institute in connexion with antirabic treatment and with the bacteriophage treatment of dysentery and cholera. As antirabic treatment is likely to become more and more decentralized the author of the report takes this opportunity of presenting statistics of 16,155 cases treated during 1917 to 1928. In this way data are made available which are comparable with the 20,500 cases of a quinquennial period analysed by MCKENDRICK. A standard, moreover, is furnished by which the future results of decentralized treatment can be gauged. Bacteriophage is issued from the institute by the Government of Assam at a price "which does not cover expenses, but places the 'phage within the reach of every dispensary." This 'phage is polyvalent for dysentery and cholera, nor is there any evidence that any one of the 'phage fractions present exerts any weakening influence upon any of the others. The dysentery component is prepared from Shiga, Flexner, Y and Sonne strains. A summary of reports on the use of bacteriophage in cholera gives 24 deaths, 2 of which were moribund cases, out of 80 treated and 50 deaths out of 92 not treated. Comprehensive and detailed tables of antirabic statistics complete the report.

W. F. Harvey.

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research for the Year 1928** [ALLEN (G. V.)].—*Federated Malay States Ann. Rep. Med. Dept. for Year 1928.* Appendix A. pp. 27–45. [2 refs.] Appendix (A) III. [Division of Pathology] pp. 58–68; and Appendix (A) IV. [Division of Entomology] pp. 69–74.

Matters of interest in this fine report include the following items :—Continued investigation of tropical typhus, endemic on a local oil-palm estate—85 cases occurred in 1927–28—show that the infection is almost restricted to men working in or round about the oil-palm tree, a fact that suggests a carrier living in these trees or their exuviae. Attempts to infect laboratory animals with the virus—largely successful with rats and occasionally with guineapigs—and unsuccessful efforts to cultivate it, are described. A long account of clinical and laboratory observations is given. In one unusual case of the disease—in a factory hand—the blood agglutinated the W strain of Proteus X9, and as a sequel experimental studies of this and the Kingsbury strain of that bacillus were undertaken and are here summarized.

From observations that in the course of the quinine treatment of malaria an increase occurred in the number of crescents, to such an extent that where 42·3 per cent. of the patients were carriers on admission 64 per cent. had become carriers on discharge, small (non-toxic) doses of plasmoquine were added to the standard treatment—with the anticipated effect of suppressing the crescent, and the local importance of this modification is emphasized. A search for precipitin tests for malaria was disappointing. "Aseplene," a widely advertised proprietary cure for malaria, was tested and found useless. Troposan (May and Baker), isomeric with stovarsol, caused rapid disappearance of the parasites in 40 tests.

Leptospirosis, until lately recognized only among rubber coolies, was this year encountered in 7 Europeans not directly connected with rubber planting. The cases are summarized along with an analysis of the clinical phenomena.

An analysis of the case-sheets of 528 consecutive hospital cases of tropical ulcer is given, with an account of various test treatments of 50 cases. The lesion appears to be restricted to coolies, and the most important predisposing cause is thought to be food deficiency. Bacteriological study has discovered very commonly a small haemolytic coccus, and also frequent diphtheroid organisms—pure cultures of which latter invariably produce a small characteristic abscess when injected into or under the skin of guineapigs. Sound surgical procedure and good feeding are thought to be above specially chosen drugs, in treatment.

Necessary investigations of leprotic fever have been pursued—its frequency, its associated lesions, its predisposition, causation, duration, its effect for good or ill and its treatment ; the most successful treatment was found to be desensitizing the patient with ephedrin or adrenalin. Details of introduced modifications of the Rubino reaction for the diagnosis of leprosy, and of the results of the Wassermann and the Kahn tests in leprosy are given, and promising results of trials of alepol and krysolgan treatments of the disease are reported.

Sanocrysin in tuberculosis appears, so far as a small experience goes, to prolong the course of the disease in Asiatics, but without promise of cure.

Among other things described are, the isolation of an organism similar to *Eberthella belfastiensis* of Wilson from a fatal case of a typhoid-like fever disclosing ulceration of Peyer's patches and multiple liver abscesses; two cases of low fever where *Alcaligenes faecalis* was believed to be responsible; five cases of cutaneous blastomycosis; three cases of yaws treated successfully with tryposan (May & Baker); 9 cases of amoebic dysentery where bistovol (May & Baker) seems to have been fairly effective; and modifications and comparisons of serological tests for syphilis.

In the report of the Pathology Department, pp. 58–68, the statistics of antirabies treatment are very fully recorded; 146 cases were treated (SEMPLE'S method), with one fatality after treatment; and 1981 dogs had the prophylactic treatment. Other matters of note are, 3 fatal cases of ascariasis, where multiple liver abscesses were due to the penetration of the worms by way of the hepatic duct; 3 fatal cases of melioidosis, where multiple abscesses were found in the liver and other viscera; a long and well-considered account of the liver treatment in cases of secondary anaemia; and a discussion of 3 fatalities occurring in the course of an antisyphilitic treatment where the patients had received 2, 3, and 4 injections respectively (among a very large number of other cases undergoing the treatment) of stabilarsan 0·3 gm. with 0·5 cc. bismostab. In the review of the morbid histology 129 malignant tumours are mentioned and particularly 12 cases of primary cancer of the liver in Chinese males.

In the Entomology Report, pp. 69–74, the problem of the carrier in tropical typhus has first place. Here a search among the material from the oil-palm trees led to the discovery of an incredible number of mites of five families among old male flowers. Furthermore, a survey of local rats has brought the number of their ectoparasites to 16 species. Tests of anopheline larvicides have confirmed the opinion that for efficiency and cost there is nothing to compare with mineral oils. An objection against Paris green, in work on estates, is that managers cannot trace and check the doings of the larvicidal gang, as they can with oil. An interesting note about breeding-places, judged by experience of over twenty thousand observations, is that very few species of Anopheles are definitely and specifically restricted to a particular type—e.g., 19 out of the 24 local species and varieties known have been found in earth drains. A large and multifarious amount of other useful routine work is recorded.

It is a pity that such an interesting report should be printed on the inconvenient and incongruous official foolscap.

A. A.

GENEESKUNDIG TIJDSCHRIFT VOOR NEDERLANDSCH-INDIË. 1929. Dec. 1. Vol. 69. No. 12. pp. 1184–1197.—Jaarverslag van de Landskoepokinrichting en het Instituut Pasteur te Bandoeng over 1928. [**Annual Report of the Vaccine Establishment and the Pasteur Institute at Bandoeng in 1928.**]

From 53 buffaloes 22,342 kgm. lymph was obtained; the quantity issued by the Institute sufficed for over 9½ million vaccinations. As far as controlled (1¼ million cases) 96·5 per cent. of the vaccinations succeeded.

Of 978 individuals reporting for antirabic treatment, 692 underwent a full cure, but the results of the examination of the suspected animals

showed that such had not been necessary in 107 of them; 309 of them had certainly been bitten by infected animals. Six patients (natives) died in the course of this year from rabies, all within 30 days from the beginning of the cure.

Of preliminary treatment with dead preserved fixed virus before their arrival at the Institute, which has been practised since 1921, no distinct results were seen. Yet it is to be continued.

The report further contains figures of the number of pathological examinations performed by the laboratory and of quantities of sera and vaccines issued by the Institute.

W. J. Bais.

GENEESKUNDIG TIJDSCHRIFT VOOR NEDERLANDSCH-INDIË. 1929. Vol. 69. No. 9. pp. 853–872.—Uit het Jaarverslag ven het Geneeskundig Laboratorium over 1928. [**Annual Report of the Military Medical Laboratory for 1928.**] [18 refs.]

It is always interesting to laboratory workers to know what routine and research investigations are being carried out in other laboratories. The reports on material sent in numbered 16,420 of which 7,186 were bacteriological, 8,563 Wassermann reaction, and 671 medico-legal. Two new species of anophelines were added to the collection: *A. longirostris* and *A. travestitus* from New Guinea and from Ceram. Altogether 187 species of mosquitoes, anophelines and culicines, are known to occur in the Netherlands Indies. It is probable that some 300 species altogether are to be found in the Archipelago. The routine investigation of suspected enterica cases gave as positive percentage results for Widal, blood culture, stool, urine, pus and post-mortem examinations 51·2, 18·8, 15·6, 6·8, 54 and 25 respectively. A method which is recommended in examination of stools for helminthic ova is to clear thick films with cedar oil. The difficulty of finding dysentery bacilli in stools, examined some time after evacuation, was exemplified by the negative result obtained when 3 freshly passed stools were hurried off to the laboratory by car and yet proved negative, while 9 cases out of 10 from the same population were positive by immediate culture on Endo plates. Treatment of an epidemic of Shiga dysentery by means of antiserum which had proved strikingly effective in other epidemics, gave very disappointing results. The opportunity was taken to test out the value of dysentery bacteriophage by oral administration as a prophylactic. There were 119 persons treated with bacteriophage with 4 cases of the disease and 242 untreated controls with 17 cases. The difference of incidence in the two groups cannot be regarded as significant, when the probable error is taken into account. A virulent bacteriophage was tested curatively for plague in two series of 16 animals, of which 12 were test animals, and 4 controls. All the animals died within 5 days, including the controls. Three treated animals, however, did live 1 to 3 days longer than the controls. The longest lived animal was the only one in which the appearances in any way resembled chronic plague, with very few bacilli in the spleen. In the malarias ection, treatment ofs alt water fish ponds with Paris green showed that it is undoubtedly possible thus to combat the danger from larvae without raising the arsenic concentration in fish or in water to any notable degree. The chemical section included among its investigations, one on the improvement of the mode of preparation of

chemically pure anti-beriberi vitamin. Anti-beriberi vitamin preparations are likely to be of great service in connexion with the Mecca pilgrimage. It was decided that the polished rice on pilgrim ships must contain 1 gm. activated acid clay per kgm. and the help of the consul at Jeddah was invoked for the sale to each pilgrim of a bottle of vitamin tablets. A preparation, used for subcutaneous and intravenous injection, was productive of some wonderful cures even in patients moribund with acute beriberi, but to the accompaniment of undesirable symptoms. Experiments on mice seem to show that the removal from the preparation of the precipitate obtained with silicotungstic acid would also obviate the unpleasant symptoms of its use in man. The report concludes with a list of publications for the year.

W. F. Harvey.

KOUWENAAR (W.). Jaarverslag van het Pathologisch Laboratorium over 1928. [**Annual Report of the Pathologic Laboratory in 1928.**] —*Meded. Path. Lab. t. Medan-Sumatra.* 1929. No. 6. 51 pp. With 6 graphs.

The activities of the Laboratory during 1928 are summarized in this report; 10,472 bacteriological and 9,931 serological examinations, 593 examinations of pathological specimen and 424 chemical tests were made. The total number of routine examinations increases year by year. Advisory and information work are mentioned. The research work, as far as of general importance, has already been published elsewhere, and previously referred to.

In an appendix, hints are given for the preservation of pathological samples, which are to be forwarded to the Laboratory and for the technic of taking samples of water for bacteriological examination,

W. J. Bais.

ARCHIVES DES INSTITUTS PASTEUR D'INDOCHINE. 1929. Apr. No. 9. pp. 83–116. With 4 charts.—Fonctionnement des Services pratiques des Instituts Pasteur d'Indochine en 1928. [**Work of the Pasteur Institutes of Indochina in 1928.**]

At Saigon, 1,318 persons underwent the complete course of treatment for rabies, without any mishap; more than 4¼ million doses of Jennerian vaccine, 5 million doses of cholera vaccine and more than 82,000 doses of Calmette's antituberculosis vaccine were distributed, and the issue of various other vaccines increased greatly. In the malaria laboratory attention was concentrated on the anopheline fauna and the study of local epidemiology.

At Hanoi, 642 persons went through the complete course of treatment for rabies, of whom 9 died of the disease, the heavy mortality being explained by the fact that 7 persons came too late for treatment and 8 had been very badly bitten; and that only 2 of those who were promptly treated died—in 18 and 19 days respectively—after the course of treatment. At Hanoi more than 6½ million doses of Jennerian vaccine, and more than 62,000 doses of antituberculosis vaccine were issued; and in the pathology department 190 malignant tumours were recognized.

The work of the Institutes in the field included, besides malaria inquests and surveys, and studies of native diets in relation to beriberi: (1) an investigation by Dr. SOUCHARD of the prophylactic and therapeutic

value of D'HERELLE's anticholera bacteriophage ; and (2) a particular study of the treatment of equine surra. The first of these expeditions was frustrated in various ways ; no opportunity of testing the prophylactic value of the bacteriophage occurred, and only 7 cases of testing its therapeutic value, and of these 7 cases 6 died, the stock of bacteriophage used being that used by D'HERELLE in India, obtained through the Hygiene Bureau of the League of Nations at Singapore. In the treatment of equine surra the new remedy of 309 Fourneau with sulpharsenol in a single injection was tried, and its efficacy was fully confirmed. Of 20 infected horses 2 were kept as controls and 18 received the treatment ; the 2 controls died, and all the others recovered completely. The new remedy therefore is hailed as a precious acquisition.

A. A.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE & HYGIENE. 1929. Jan. 30. Vol. 22. No. 4. pp. 303–308.—**Laboratory Meeting.**

The Laboratory Meeting of the Royal Society of Tropical Medicine on November 15th, 1928 seems to have been quite a tea-party for medical entomologists. Miss Mary BEATTIE provided living larvae of British tree-hole-breeding mosquitoes, and Miss E. K. SIKES an exhibit of larvae, pupae, and adults of fleas (*Ceratophyllus wickhami*) from a squirrel's nest, along with living Chalcid parasites of the larva of that flea ; Dr. P. A. BUXTON furnished forth an interesting assortment of *living* insects and other arthropoda, including 4 species of Rhynchota, *Glossina tachinoides* reared from puparia in London, various stages of *Ornithodorus moubata*, a larva of *Megarhinus brevipalpis* transported without mishap from Nigeria, 4 common but important insect-pests of food-stores, and resting larvae and pupae of the Halticid beetle of the Kalahari, *Diamphidia nigro-ornata*, used locally for envenoming arrows ; Mr. B. JOBLING contributed mounted specimens of eggs, larvae, and adults of British midges ; Dr. A. C. STEVENSON showed sections of monkey-lung invaded by the notorious Gamasid mite Pneumonyssus ; and Dr. V. B. WIGGLESWORTH displayed photographs illustrating the bionomy and methods of control of tsetse-fly (*Glossina morsitans, tachinoides* and *palpalis*) in West Africa.

Medical protozoologists also were well entertained. Dr. J. L. DAVIS showed blood-films illustrating a new Babesia from a Sudan wild cat ; Dr. C. M. WENYON displayed a cinematograph film portraying scenes in the kala-azar areas of Bengal, photographed by Dr. Everard NAPIER ; and he and Dr. E. HINDLE exhibited preparations showing the result of intratesticular inoculation of the hamster with *Leishmania tropica* ; Dr. WIGGLESWORTH showed developmental forms of trypanosomes in tsetse-fly ; and Professor YORKE exhibited preparations showing developing crescents, and a preparation displaying large numbers of exflagellating crescents obtained by the concentration (immediate centrifugating) of a solution in citrated saline of material got from infected spleen by puncture.

Dr. P. MANSON-BAHR and Dr. H. WILLOUGHBY produced documents relating respectively to an extraordinary case of amoebic hepatitis, to a case of generalized infection with *Schistosoma mansoni* in a European, and to a case of splenic anaemia resembling kala azar in a European seaman ; also photographs of chigger infection ; and photographs and skiagraphs of a case of ainhum with complications. Major H. C.

BROWN and Dr. J. C. BROOM demonstrated a simple microcataphoresis cell for the study of the migration rate of bacteria. Sir A. CASTELLANI exhibited a collection of pathogenous fungi, and another of bacilli of the metadysentery group; Dr. Salisbury SHARP a case of goundou in a man who has always lived in England; and Dr. WENYON one blood-film showing a mixed infection of microfilariae—*F. bancrofti* and *F. malayi*—and another showing a vegetable filament deceptively like a microfilaria.

A. A.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE. 1929. June 25. Vol. 23. No. 1. pp. 1–7. **Laboratory Meeting.**

The Exhibits included: Cultures and preparations of *Trichomonas vaginalis*, from a survey of 100 individuals in England, in whom evidence of infection occurred in 15 by direct smear and in 20 by culture.—Dr. Mary ANDERSON. Trypanosomes from blood of canary and their developing forms in the body-cavity of a living bird-mite, *Dermanyssus gallinae*.—MACFIE & THOMSON. Plate cultures of *Trypanosoma cruzi* and of Leishmania, showing developing forms.—RAY. Leptomonas from labrum and gut of *Glossina morsitans*.—ROBINSON. Sporulating forms of *Plasmodium falciparum* in placental blood.—GRAY. Preparations showing influence of temperature upon exflagellation of microgametocytes of *Plasmodium vivax*: at 25° C. exflagellation occurred in 5 to 7 minutes in July but in not less than 15 minutes in February; between 10° C. and 19° C. not in an hour, and after 4 hours flagella were formed but were not detached; at 0° C. nothing was observed after 24 hours.—JAMES. A suctorian Infusorion, *Allantosoma intestinalis*, from the intestine of a horse, recovered from the faeces by Sheather's sugar flotation method.—WENYON and SHEATHER. Sections of yellow-fever liver showing in the nucleus of the liver-cells eosinophile inclusions resembling those found in other diseases caused by filterable viruses; sections of other origin and provenance, showing Negri bodies and other similar intranuclear inclusions, were shown for comparison and to support the accepted opinion that yellow fever is caused by a filterable virus.—HINDLE and STEVENSON. A new tsetse-fly of the *G. palpalis* group, from the Belgian Congo.—AUSTEN. Some Culicines from China.—MACARTHUR. Larva and pupa of *Hodgesia sanguinis*, a mosquito from Lagos; the pupa showing the characteristic bifid breathing-trumpets.—WIGGLESWORTH. *Pneumonyssus griffithi*, a mite from the lung of a monkey, and *Acarapis woodi*, another mite from the tracheae of a hive-bee.—JOBLING.

The apparatus and methods demonstrated included: A portable apparatus for the electrical determination of H ion concentration.—BROWN and BROOM. An adaptation of the HORROCKS Box for estimation of available chlorine in bleaching-powder, details of which were published in the Journal of the R.A.M.C., in August, 1927.—ELLIOTT. The nigrosin method of demonstrating spirochaetes and such-like.—GRAY. Aids to the accurate counting of hookworm larvae, illustrating not only the advantage of a flat-bottom dish, to obviate focussing, but also the necessity of having the dish brim full of water under cover, to eliminate rippling.—LANE. Photographs of a case of Ulcerating Granuloma showing slow but sure results of treatment by injections of tartar emetic combined with stimulative protein therapy.—LOW.

A. A.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

Dunn (T. B.). **Amoebiasis.**—*China Med. Jl.* 1929. June. Vol. 43. No. 6. pp. 564–577.

A concise and lucid exposition of the whole state of amoebiasis as known up-to-date, and rather more than is known by verifiable and demonstrable proof ; for the author has marred an excellent summary of an important subject by uncritical [apparent] acceptance as amoebic of clinical syndromes—e.g., arthritis, ocular lesions and defects, neurasthenia, etc.,—whose relation to amoebiasis is still only in the region of individual fancy. He accepts apparently the dictum that amoebiasis is as protean a disease as syphilis. On the other hand he has stressed the importance, too often ignored, of McCarrison's experimental work with monkeys ; the control monkeys remained healthy while those fed on deficient vitamin diets very often broke down with acute amoebic dysentery. Applying this to his practice the author records his success with amoebiasis patients who had been under treatment unbenefited for long periods of time. He stopped all medication and limited diet, put them on a full diet rich in vitamins, and " almost like magic, they commence to gain weight and all symptoms disappear."

H. M. Hanschell.

Manson-Bahr (Philip) & Tait (C. B. V.). **On the Symptomatology of Intestinal Amoebiasis. Based on a Study of 150 Cases.**—*Lancet.* 1929. Nov. 16. pp. 1028–1032. •With 2 text figs. [6 refs.]

This informative paper gives a close analysis of 150 consecutive cases of intestinal amoebiasis. *E. histolytica* was demonstrated in each, and in the majority the diagnosis was reinforced by sigmoidoscopy. The authors begin by stating that the more extensive his experience of intestinal amoebiasis, the more the practitioner is bound to be impressed by the great variety of the symptoms which infection with *Entamoeba histolytica* may provoke. And in conclusion they state that the connexion between intestinal amoebiasis and the signs and symptoms is difficult to determine precisely. It depends possibly on the nature and extent of the intestinal ulceration whether the pain and discomfort are referred to one portion of the bowel or the other. Why the same infection should produce active diarrhoea in one person, and chronic constipation and flatulency in a second, cannot at present be determined. It probably depends upon the amount of mucous membrane destroyed by the amoebic infection or the resistance of the patient to this particular infection. The diversity in the nature and severity of the symptoms produced render intestinal amoebiasis one of the most protean of all protozoal infections. [This paper deals especially and fully with symptoms—and to give abstracts of a protean symptomatology must be to misreport and perhaps mislead. Only an indication can be here given of the paper's content and real worth to the clinician, who should read the original.]

Analysis of 150 *Cases of Amoebic Dysentery, Symptomatology, etc.*

Distribution of Pain.

(Male cases, 133 ; Female, 17.)

Abdominal pain or discomfort :—	
Present in	126
Absent in	24

	Cases.
Generalized abdominal pain	70
Epigastric discomfort ...	19
Liver area	9
Gall-bladder area (right costal margin) ...	2
Right shoulder (referred pain)	2
Gastric localized ...	3
Duodenal localized ...	1
Transverse colon	1
Caecal and appendicular...	7
Sigmoidal and descending colon	10
Lumbar localized ...	2

Maxima and Minima.

	Years.
Age at onset :—	
Maximum	64
Minimum	$10\frac{1}{12}$
Maximum duration ...	30
Maximum period without active symptoms ...	6

Bowel Symptoms.

	Cases.
Diarrhoea	114
Alternating diarrhoea and constipation	8
Constipation	11
Normal regularity of motions	17
Flatulence	37

Bowel Symptoms (cont.).

	Cases.
Tenesmus	34
Blood and mucus in stools	71
Mucus only in stools ...	18

General Symptoms.

	Cases.
Pyrexia	13
Hepatitis	9
Emaciation	43

Previous Diagnoses.

	Cases.
Neoplasm of pancreas—laparotomy	1
Cholecystitis and cholelithiasis	3
Appendicitis and appendicectomy	4
Duodenal ulcer	1
Tuberculosis	1
Bacillary dysentery ...	1
Septicaemia (pyrexial case)	1

Intercurrent Diseases.

	Cases.
Kala-azar	1
Hepatic abscess	5
Tuberculous mesenteric glands	1
Pulmonary tuberculosis ...	1
Malaria and ankylostomiasis	1
Malaria and ascariasis ...	1
Cystitis	1
Pregnancy	1
Pneumonia	1
Malaria	2
Sprue	2
Gonococcal epididymitis...	1

The authors note that intestinal amoebiasis may be one of the most persistent of all protozoal infections. In four of these cases infection, and symptoms, had lasted for over 20, and in one case for 30 years. Moreover symptoms of dysentery may vanish temporarily—even for long periods with apparent restoration to health—and then return, perhaps long after leaving the place where infection was acquired. In this series such a latent period of 6 years was noted in two cases ; in yet another perhaps 9 years. Latent periods of two or three years were common. The authors note that this seems as if the clinician must wait 6 years or more to ascertain finally whether the cure had been in fact successful. Occurrence of relapse may be sudden in onset, with severe diarrhoea and loss of weight. A straightforward case is usually apyrexial ; absence of high temperature is generally a valid point of differentiation between intestinal amoebiasis and bacillary dysentery. In this series 13 cases of pyrexia could not be accounted for by any other associated infection, or by coincident amoebic hepatitis. One case

presented swinging septicaemic type of fever, probably due to absorption of septic matter from bowel wall ; another a continuous fever ; five cases fever acute in onset like malarial attack, for which they were mistaken, due the authors think to recurrent embolism of liver by amoebae from the bowel. Among the cases were also noted ulceration of rectum without involvement of rest of large bowel ; intestinal haemorrhage ; painful spasmodic contraction of sigmoid colon ; haemorrhoids ; prolapse of rectum.

Neither stricture of bowel nor actual interference with passage of faeces as result of amoebic ulceration was observed. But there occurred as sequelae dilatation of colon, megacolon, 2 cases ; sprue, 2 cases. Though the intimate connexion between amoebic dysentery and hepatic abscess is universally recognized, they are seldom observed at the same time in the same individual. This association was noted 5 times in the 150 cases.

H. M. H.

JOHNS (F. M.) & TRIPOLI (Carlo J.). **The Incidence of Infection with *Endameba histolytica* in Louisiana as determined by Comparative Microscopic and Cultural Methods.**—*New Orleans Med. & Surg. Jl.* 1929. Oct. Vol. 82. No. 4. pp. 224–226. [7 refs.] [Med. School, Tulane Univ., New Orleans.]

Combined cultural and microscopical examination of stools of 544 inhabitants of Louisiana revealed 36, or 7·44 per cent., infected with *E. histolytica*—of whom 6, or 1 per cent., presented definite symptoms of dysentery with vegetative forms of the parasite present in stools. Thirty-five, or 6·43 per cent., were cyst carriers. A plea is put in that not only a physical examination but also a stool examination for intestinal parasites should be enforced before giving certificates for food handling.

H. M. H.

WILLIAMS (L. H.) & THOMAS (J. A.). **A Study of the Incidence of Amebiasis Carriers among Native Domestics of Haiti.**—*U.S. Nav. Med. Bull.* 1930. Jan. Vol. 28. No. 1. pp. 74–78. [4 refs.]

The occurrence of amoebiasis among Caucasian residents in and visitors to Haiti, who had not before been aware of any chronic intestinal disturbance, or previously found to harbour *E. histolytica* cysts, and who were not exposed to the infection in Haiti other than through hand contact by native food handlers, led to this study. Using the stool examination technique of D. de Rivas [not described here] they found 50 per cent. of 108 food-handling negro domestics to be carriers of *E. histolytica* cysts. Later examination of 6 of these infected domestics revealed vegetative as well as encysted forms. All six had suffered from alternating constipation and diarrhoea. All the proved carriers were, at least temporarily, apparently deinfested and rendered non-infective, with comparative ease by administration per os over short periods of time of yatren and paroxyl. This, the authors think, is a hopeful indication that ere long progress can be made in the eradication of this tremendous reservoir of amoebiasis. Effective sanitation is, and will be for years, impracticable in the country districts of Haiti. [Careful observations of immediate and real hygienic value.]

H. M. H.

CRAIG (Charles F.). **The Diagnosis and Treatment of Latent Amoebic Infection.**—*Internat. Clinics.* 1929. Mar. 39th Ser. Vol. 1. pp. 77–94. [16 refs.] [Army Med. School, Washington.]

A very interesting review of the subject, in which the author states: The diagnosis of latent infections with *E. histolytica* which are accompanied by symptoms is made from study of the clinical history and picture and the results of cultural and microscopical examinations of the stools, together with result of the complement fixation test in selected cases, and in those without appreciable symptoms by demonstration of the parasite in the faeces. In the author's experience the symptomatology of latent *E. histolytica* infection is confined chiefly to digestive and nervous systems—although some authorities [*sic*] have described symptoms connected with the eye and other organs of special sense. In this paper symptoms, technique of diagnosis by microscopical and cultural examination of faeces, complement fixation test, and treatment receive exposition and discussion. Finally, the author insists that the majority of so-called "healthy carriers" of *E. histolytica* present symptoms due to this parasite, and that all cases must have definite lesions in the intestine caused by the parasite, even though microscopic in size. The finding of *E. histolytica* in the faeces of an individual demonstrates that he is infected with that parasite, and not necessarily that the parasite is the cause of the symptoms that may be present. That it is the cause can be proven only by treating the amoebic infection and observing the result upon the symptoms. [And on such proof in his hands the author claims to base his contentions.]

H. M. H.

ROSE (Werner J.). **Amebic Dysentery in Western New York with a Report of Six Cases.**—*Bull. Buffalo General Hosp.* 1928. Dec. Vol. 6. No. 2. pp. 35–40. With 5 figs. [7 refs.]

The author notes that although amoebic dysentery appears to be rare in Western New York, there is reason to believe that many cases remain undiagnosed and it must be emphasized that its sporadic occurrence in northern climates is by no means an anomaly. The importance of examination of stools for amoebae in suspicious cases is obvious. Of eight cases occurring in Western New York since 1921, six are here reported in detail.

H. M. H.

BISHOP (Louis F.) & BISHOP, Jr. (Louis F.). **A Study of Amebiasis in New York City.**—*Amer. Jl. Trop. Med.* 1929. Sept. Vol. 9. No. 5. pp. 297–307. [6 refs.]

This study shows that endemic amoebiasis in New York City is not rare. The authors reached no conclusions as to its epidemiology. They believe more attention should be paid to the diagnosis of carriers of *E. histolytica* and especially to the technique of faeces examination.

H. M. H.

PANAYOTATOU (Angélique). Ueber einige Fälle chronischer Amöben-Enterocolitis bei Kindern. [**Chronic Amoebic Enterocolitis in Children.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Nov. Vol. 33. No. 11. pp. 595–597. [1 ref.]

The author records her observations, in Alexandria, of chron c amoebic enterocolitis in children 4 to 10 years old. Mucosanguineous

diarrhoea alternates with constipation, the children are apathetic, and have no inclination for play. There is loss of appetite and of sleep. The stools reveal the cysts of the dysentery amoeba and sometimes free amoebae as well. Brief clinical descriptions are given of three typical cases. The author has obtained better results from treatment by stovarsol 0·15 gm. per os, combined with yatren "105" enemas, than by intramuscular injections of emetine. The former therapy was followed by rapid cessation of pain, disappearance of blood, mucus and parasites from stools, and recovery of normal mentality. Remissions of apparent good health were of months longer duration. H. M. H.

BOINET, TURRIÈS & POURSINES. Quadriplegie à marche ascendante (par radiculo-nevrite) survenue à la suite d'une dysenterie des pays chauds traitée par l'émétine. [**Ascending Quadriplegia following Emetine-treated Dysentery.**]—*Marseille-Méd.* 1929. Sept. 25. Vol. 66. No. 27. pp. 375–380. [2 refs.]

This male patient had had malaria, and probably syphilis, and in May, 1928, severe dysentery and hepatitis in Saigon. In June liver puncture —250 cc. pus aspirated; then given 12 daily injections emetine [total quantity not stated]. This was soon followed by steadily increasing muscular weakness and atrophy, till at end of November quadriplegia was complete. Patient lay helpless in bed, able only with effort to turn on side. No loss or change of sensation; no trophic or circulatory changes in skin or joints. No loss of sphincter control. No sign of mesencephalitis nor of bulbar paralysis. Marked muscular atrophy and paralysis confined to arms, legs and buttocks. [No tenderness or pain of muscle recorded.] Complete loss of tendon reflexes. No hypertonicity and no contractures. No psychic changes. Wassermann positive in blood, negative in cerebrospinal fluid. [No record of cardiac function nor of electrical reactions.] In the end with no treatment other than symptomatic, gradual but complete recovery. It was noted that recovery of function directly followed recovery of muscle volume. The authors consider this a severe peripheral polyneuritis, due to action of toxins, especially of amoebae, but also of malaria and syphilis, perhaps aggravated by emetine, on the motor nerves. [But very much more like a case of emetine poisoning of muscle cells.]

H. M. H.

KHOURI (Joseph). Quelques observations relatives à l'amibiase en Egypte. [**Observations on Amoebiasis in Egypt.**]—*Rev. Prat. Malad. des Pays Chauds.* 1929. Oct. Year 8. Vol. 9. No. 10. pp. 471–472, 475–477.

The author [a Daniel come to much-needed judgment] subjects certain recorded cases of amoebiasis in Egypt to criticism informed and sustained by his own first-hand and lengthy experience of the exacting technique required for the actual demonstration of amoebae; a matter that, as he has recorded, has brought him into conflict on the very diagnostic point of what is an amoeba, with some of his colleagues. He puts it forward that vesico-renal and pulmonary (bronchitic) manifestations due to the dysentery amoeba must be extremely rare, notwithstanding the number of cases reported in Alexandria; for in five consecutive years of close attention to this question, during which he had examined a number of these cases, he had failed to find a single case in which amoebic origin could be shown.

Moreover, the absence in his laboratory of amoebae and of amoebic cysts, though searched for by methods "les plus accrédités," in specimens of urine and sputum, when other laboratories had found those parasites in numbers, or when the diagnosis of amoebiasis had been based on the clinical improvement following on emetine therapy—shows the confusions to which 'analystes' and clinicians have succumbed when they declare as amoebic pathological cases which have nothing in common with amoebiasis. The fact remains that in spite of the divers authors and the number and variety of their cases, none of these recorded cases of vesico-renal or bronchial amoebiasis had been investigated by "une technique impeccable et dans un esprit de rigueur scientifique." The practical consequences are doubly deplorable; for, on the one hand, too many clinicians, bothering little about "l'examen parasitologique," classify under the rubric 'amoebiasis' affections etiologically different, founding their diagnosis solely on the more or less favourable effect of emetine (whose physiotherapeutic action is far from being limited to amoebic infestation); and on the other, there results an inconsiderate and often unjustified use of emetine, subjecting the patient to a severe treatment, which may even be harmful.

H. M. H.

No-Lorandos & Pangalos (G.). La dysenterie amibienne en Grèce. [**Amoebic Dysentery in Greece.**]—*Presse Méd.* 1929. Sept. 4. Vol. 37. No. 71. pp. 1152–1153.

In a brief note the authors record both the scantiness of Greek published observations on this subject, and their own observation from hospital and private practice that amoebiasis and amoebic dysentery is widespread in Greece, some of it recently imported and much of it endemic and probably of old time. In 560 examinations at the orphanage of the "Near East Relief" 208 amoebic carriers were found, of which 60 were characteristic *Entamoeba histolytica* cases, about 11 per cent. Approximately the same percentage of *E. histolytica* carriers obtained among their private patients.

H. M. H.

Pappalardo (Concetto). Nuove osservazioni sull' amebiasi in Sicilia. [**Further Observations on Amoebiasis in Sicily.**]—*Policlinico.* Sez. Prat. 1929. Sept. 9. Vol. 36. No. 36. pp. 1284–1287. [19 refs.] [Med. Clinic, Univ., Catania.]

It is now believed that amoebiasis is endemic in Sicily. During the period February, 1926–June, 1928, the author has met with a hundred cases. Forty of these were from Catania itself and 20 in the Province, 23 from Syracuse and 17 from Caltanissetta. In 84 of these *E. histolytica* was found alone, in the remainder with other protozoa, such as Giardia or Trichomonas, or helminths as Ascaris or Taenia. The commonest clinical type (in 73 cases) was a recurrent enterocolitis; other forms such as "dyspeptic," pseudoappendicular and acute dysentery were much rarer. In five instances metastatic hepatitis was recorded.

Warning is given against increasing the dose of emetine, as the author has seen fatal results therefrom. He gives only 2–4 cgm. subcutaneously for 4–6 days, followed by 0·25 gm. stovarsol twice daily for a fortnight; repeating both if necessary.

H. Harold Scott.

SNIJDERS (E. P.). Autochtone amoeben-dysenterie in Nederland in verband met de epidemiologie dezer ziekte. [**Autochthonous Amoebic Dysentery in Holland and its Epidemiology.**]—*Nederl. Tijdschr. v. Geneesk.* 1929. Dec. 14. 73rd Year. 2nd Half. No. 50. pp. 5834–5848. [18 refs.]

A case of amoebic dysentery occurring in an individual who had never been out of Holland forms the text of this lecture. The case is firstly set out for the audience, with the individual himself in attendance, in all the detail of onset, symptoms, diagnosis and treatment. It is the case of a young man, 25 years of age and a painter by occupation. In the second part of the lecture the author considers the course of the disease in this particular case, the microscopic examination of the stools, the development of the disease from onset and appearance of large *histolytica* forms in the blood stained mucus of a diarrhoeic stool to the stage of disappearance of symptoms and the appearance of *minuta* forms and cysts in a formed stool. The only medicament so far administered in this case has been emetine. Two questions present themselves for answer at this point. Is the patient really cured and why has he received no treatment with the highly esteemed yatren? The answer to the first of these questions is: Yes, clinically, but not protozoologically. He has become a healthy carrier of amoebae and a distributor of cysts to other hosts. The case was brought forward in order to show primarily the marked curative effect of emetine upon the disease process. In spite of treatment, however, the *minuta* forms of the amoeba can live as commensals on the mucus of the intestine. But the equilibrium of this commensalism can be upset. The amoebae may invade the tissue of the intestinal wall and pass into a *histolytica* form, with loss of cyst producing capacity. And thus it is that the patient is to be regarded as not only a distributor of infection but, in virtue of the continued presence of *minuta* forms, as a danger to himself. Endeavour then must be made to effect a protozoological and not merely a clinical cure of the patient. To bring this about he should now receive yatren treatment, the detail and difficulties of which are described.

How did this individual contract this so-called tropical disease? One fact of seeming importance is that he was accustomed to bathe frequently in water fouled with the dejecta of ships from the tropics. But other facts also bear on this case. In particular it was found that in the patient's family, consisting of father, mother and 8 children, the father, a brother and two sisters had also suffered from the disease. An analysis of the data renders it probable that the father was the first to become infected and that his infection also might be traced to bathing in specifically contaminated water. The family history therefore allows of the possibility of water infection and of contact infection. Is it to be inferred that all amoebic dysentery in Holland is in reality referable to a tropical source or to contact transmission arising out of such an original infection? If so, how is the infrequency of clinical dysentery as compared with the tropics to be explained, especially as the healthy carrier is by no means of infrequent occurrence? The questions are more easily put than answered.

There follows then the 3rd and final part of the article with treatment of the statistics of case and carrier frequency and of the question whether two distinct species of dysentery organism exist, morphologically alike, but one the harmless *Entamoeba dispar* of temperate zones and the other

the pathogenic *Entamoeba dysenteriae* of the tropics. The author finds little convincing evidence in the facts adduced for the existence of two distinct species. He takes up the subject of an original tropical source for all autocthonous dysentery of temperate climes. The adult male population of Holland should, on the data available, provide not less than 200,000 " carriers," even though actual cases are few. Would a survey show the distribution of such carriers concentrated around the ports of the country and diminishing in numbers in the interior ? An investigation on these lines would be interesting, but would perhaps be more fruitful if carried out in Germany than in a country like Holland, which for so many centuries has been connected through its ports with the tropics. The author throughout the article has raised many points of which this summary has selected but a few. He concludes with the remarks that there is no end to the questions which might be asked on this subject and that much work still requires to be done for their elucidation.

W. F. Harvey.

Revue Pratique des Maladies des Pays Chauds. 1928. June–July. Year 7. Vol. 8. No. 6–7. pp. 295–368. [21 refs.] Numéro consacré à l'amibiase. [**Amoebiasis.**]

This number contains nine papers concerning various forms of illness which the respective authors attribute to amoebic infection—but in most cases on grounds not convincing to everyone and the references are to papers no more convincing.

H. M. H.

Petzetakis (M.). De la réalité de la cholécystite amibienne. [**The Reality of Amoebic Cholecystitis.**]—*Ann. de Méd.* 1929. June. Vol. 26. No. 1. pp. 66–90. With 4 text figs. [56 refs.]

——. Les formes cliniques de la colecystite amibienne.—*Arch. Ital. Sci. Med. Colon.* 1929. July 1. Vol. 10. No. 7. pp. 293–315. With 3 text figs. English summary p. 316. [Greek Hosp., Alexandria, Egypt.]

In this long paper, various clinical types of '*amoebic*' cholecystitis as observed by the author, are fully described : and possible routes of infection of gall bladder are discussed. The author's claim to be the first (1924) to describe this 'amoebic' cholecystitis has not been challenged. He gives many references to previous publications of his on the subject—and to the papers of those (hitherto few) others who also and later have observed 'amoebic' cholecystitis ; and to the papers of some others on amoebiasis in general: but to the work of none of those of unquestionable competence and experience who have insisted on parasitological proof for any and all amoebiasis, and pointed out the only means by which that proof can be obtained, and errors in diagnosis avoided. To ignore their work is at this date become disreputable. It is not therefore surprising that the author can " conclude " that the existence of amoebic cholecystitis has been proved by direct demonstration of the amoebae in the pus from the gall bladder ; in the vomited bile ; or in the fluid recovered by duodenal intubation : moreover, and also, by the rapid and satisfactory effect on clinical symptoms and local signs of specific [emetine, arsenicals] treatment.

[A leading example of the fanciful "amoebiasis" that has now become extremely boring. In fact, no parasitological proof whatsoever of the amoebic nature of this cholecystitis has yet been put forward by the author nor by any one of his supporters—nor have they yet shown any awareness of what such proof might be. And only restricted acquaintance with the clinical effects of the 'specific' drugs enables the claim of 'proof by specific therapy' to be entered.]

H. M. H.

SFAMENI (M.). Esiste una colecistite amebica primaria ? [**Is there such a Condition as Primary Amoebic Cholecystitis ?**]—*Riforma Med.* 1929. Nov. 16. Vol. 45. No. 46. pp. 1547–1551. [20 refs.] [Inst. of Path. & Clin. Med., Univ., Messina.]

This, though short, is a well-reasoned paper. The author discusses the possible routes by which *Entamoeba histolytica* could reach the gall-bladder. Those who believe in amoebic cholecystitis base their diagnosis on : (1) The signs of cholecystitis in a patient suspected or proved to have dysentery ; (2) Finding of Entamoeba in the fluid extracted by the duodenal sound ; (3) The effects of emetine and stovarsol. The author quotes cases to show that signs of cholecystitis may exist in amoebic hepatitis with the gall-bladder unaffected ; and concludes that primary amoebic cholecystitis is not an entity, apart, that is, from hepatic disease.

H. Harold Scott.

MARWITS (E. L.) & VAN STEENIS (P. B.). Een geval van amoebiasis cutis na de incisie van een pericoecaal absces (Phagédénisme cutané amibien). [**A Case of Cutaneous Amoebiasis after Incision of a Pericoecal Abscess.**]—*Geneesk. Tijdschr. v. Nederl.-Indië* 1929. Oct. 1. Vol. 69. No. 10. pp. 950–957. With 1 fig. & 1 chart on 2 plates. [16 refs.]

After the incision of a slowly developed, apparently appendicular abscess, a quickly spreading ulcer formed itself round the wound. All therapeutical efforts remained futile until amoebae of the histolytic type were discovered in the pus (abundantly on the edge of the ulceration) and prompt recovery followed the administration of a course of emetine injections and stovarsol per os. The literature is briefly quoted and the pitfalls of the diagnosis are discussed. No reasonable doubt appears justified as to the correctness of the diagnosis in the authors' case.

W. J. Bais.

BARRETT (J. H.). **Radiological Examination of the Liver in Cases of Suspected Amoebic Abscess.**—*Indian Med. Gaz.* 1929. July. Vol. 64. No. 7. pp. 375–376.

The author declares that a perusal of "the more recent text books which deal with tropical diseases reveals the fact that the radiographic diagnosis of amoebic abscess has scarcely been considered at all."

In this interesting paper the matter is duly considered, and actual clinical cases are cited. The diaphragm range is measured on the screen with a compass. The trunk-vertical position is the best. The fluoroscopic part of the examination need not take more than a few minutes : an opinion, however, cannot be given on fluoroscopy alone. Skiagrams are essential. In fluoroscopy use an electric current of 3 m.a. Larger currents are unnecessary and may give rise to screen-lag.

A diagnosis of liver abscess, doubtful on clinical signs alone, may be cleared up on X-ray examination ; when also presence or absence of lung complications may be indicated, and prognosis assisted. Cases of hepatitis negative to amoebic abscess radiographically usually yield to non-operative measures—emetine, etc. In the author's experience no case where X-ray evidence was wholly negative has subsequently been proved to have been a case of abscess of liver.

H. M. H.

COSTANTINI (Henri). Pour la suture primitive dans le traitement chirurgical des abcès amibiens du foie. [**Primary Suture in the Surgical Treatment of Amoebic Liver Abscess.**]—*Presse Méd.* 1929. Nov. 20. Vol. 37. No. 93. pp. 1511–1512.

The author pays tribute to the value of emetine (ROGERS 1912) in reducing mortality of amoebic liver abscess from 50 to 4 per cent. He cites his own series of cases (22—one death) in support of his contention that primary suture after operation is of advantage. Stitches are removed on 10th day and cure is then complete, in contrast to the average two months of dressings and convalescence after open drainage, with its risk of secondary infection of abscess cavity. Primary suture can be done if—and this point is stressed—microscopical examination of the pus obtained at operation reveals no bacterial infection. The author, however, acknowledges that many cases of amoebic liver abscess can be cured by simple aspiration and emetine injections [and it can be inferred from his paper, though it is not definitely stated, that he administers emetine to the cases he treats by open operation and primary suture].

H. M. H.

i. CONNELL (W. Kerr). **An Unusual Complication of Liver Abscess.** —*Kenya & East African Med. Jl.* 1929. Oct. Vol. 6. No. 7. pp. 195–197.

ii. MCNABB (J.). **Case of Liver Abscess in a Native.**—*Ibid.* pp. 197–198.

i. A full record of a rare complication of liver abscess. The condition appeared to be one of early duodenal obstruction due to kinking of the gut as result of adhesions caused by the perihepatitis associated with the original liver abscess, 4 months previously. By pressure on abdomen the patient was able to overcome the obstruction mechanically. Operation disclosed that obstructional dilatation was limited to the first part of the duodenum—doubtless ultimately dilatation of stomach would have occurred. Recovery was rapid and uneventful.

ii. The patient had had dysentery ; but examination of faeces revealed only tapeworm eggs : fever every evening : liver and spleen enlarged : constant tenderness on pressure in right eighth intercostal space in mid-axillary line. No rigors nor sweating. Total leucocyte count 22,400—general increase not of polymorphs alone. Slight haemoptysis on one occasion. Emetine grain 1 hypodermically daily for one week brought temperature to subnormal ; and spleen decreased nearly to normal size ; but no change in liver. Aspiration with needle at tender intercostal point ; less than 1 pint pus ; liver decreased then to normal size. Emetine therapy resumed.

H. M. H.

ACTON (Hugh W.) & CHOPRA (R. N.). **Kurchi Bismuthous Iodide, its Value in the Treatment of Chronic Amoebic Infections of the Bowel.**—*Indian Med. Gaz.* 1929. Sept. Vol. 64. No. 9. pp. 481–487. [16 refs.]

A fully described research of immediate importance. The authors state that their experience in the use of the total alkaloids of Kurchi bark in the treatment of acute and chronic amoebic infections of the bowel justifies them in the following conclusions :—

" (1) In the laboratory, and to a greater extent clinically, the total alkaloids of kurchi bark are far superior to emetine.

" (2) The kurchi alkaloids can be given in large doses, and so far no depressant, emetic, or irritative effects have been observed by us. They are much less toxic than emetine.

" (3) Intramuscular injections of 2 grains of the total alkaloids cause transient hyperaemia and oedema ; this is not visible to the eye unless the dose is injected subcutaneously, and the swelling passes off in 24 to 48 hours. Injections should be used for acute cases of amoebic dysentery.

" (4) The kurchi bismuthous iodide can be given orally in 10-grain doses twice a day for 10 days without any deleterious effects.

" (5) In chronic amoebic colitis, 4 grains of kurchi bismuthous iodide given orally twice a day for ten days cured 12 out of 18 cases, compared with one out of every two with emetine bismuthous iodide.

" (6) Intramuscular and oral administration of the total alkaloids of kurchi bark cure non-suppurative hepatitis ; their action on suppurative amoebic hepatitis has still to be investigated.

" (7) The administration of the total alkaloids of kurchi bark, instead of conessine only, means a larger yield of the drug, and therefore cheapness in production."

H. M. H.

VAN DEN BRANDEN (F.). Essai de traitement de l'amibiase intestinale par le Rivanol. [**Treatment of Intestinal Amoebiasis by Rivanol.**]—*Ann. Soc. Belge de Méd. Trop.* 1929. June 30. Vol. 9. No. 2. pp. 185–190. [7 refs.]

The author gives brief clinical records of 6 cases of dysentery (*E. histolytica* present in stools) in natives treated by rivanol. Three benefited. In the other three no improvement followed, and entamoebae did not disappear from stools.

H. M. H.

JONES (P. H.) & TURNER (R. H.). **Iodoxyquinolin Sulphonic Acid in the Treatment of Amebic Dysentery.**—*Jl. Amer. Med. Assoc.* 1929. Aug. 24. Vol. 93. No. 8. pp. 583–586. [19 refs.] [School of Med., Tulane Univ. of Louisiana, New Orleans.]

Following up their previous paper [see this *Bulletin*, Vol. 24, p. 12] the authors now report results of treatment by iodoxyquinolin sulphonic acid (Yatren) of a further 64 patients. 42 gm. constituted a course of treatment. Observation of the cases extended for from one to three years. The drug is simple to administer and is without danger. One patient, who received one-third the proper dose, did not experience any relief from dysentery. In another who had dysentery with cutaneous amoebiasis, the dysenteric symptoms were controlled, but the cutaneous ulceration continued to show amoebae after considerable treatment. In all the remaining cases there was a prompt and satisfactory response to treatment. The response of children receiving

doses in proportion to age was similar to that of adults. There were no dietary restrictions. No toxic manifestations were noted. Stools of ten patients were examined for cysts some time after the completion of treatment and nine were negative.

Thirty-five patients, or 90 per cent. of those with a satisfactory follow-up, were symptom-free from one to three years after treatment —an average of twenty months. The remaining 10 per cent. (or 4 patients) either had a relapse with proved amoebic dysentery or showed encysted amoebae in the stools. Further treatment with yatren was apparently efficacious.

H. M. H.

DOBELL (Clifford) with the co-operation of BISHOP (Ann). **Researches on the Intestinal Protozoa of Monkeys and Man. III. The Action of Emetine on Natural Amoebic Infections in Macaques.**—*Parasitology.* 1929. Nov. Vol. 21. No. 4. pp. 446–468. With 1 chart in text. [21 refs.] [National Inst. for Med. Research, Hampstead, London.]

A very interesting research conducted with rigorous care. Five tame monkeys (3 *Macacus sinicus*, and 2 *M. rhesus*) were treated with emetine bismuth iodide per os, in order to study the effects of the alkaloid upon their intestinal amoebae (and other protozoa). These monkeys were originally infected with *Entamoeba histolytica* (large and small strains), *Entamoeba coli*, *Endolimax nana*, *Enteromonas* (=*Tricercomonas*), and *Giardia*. The treatment ultimately eradicated the *E. histolytica* infections from four out of five animals, but did not remove any of their other intestinal protozoa.

It was found necessary to administer 60 mgm. of emetine bismuthous iodide daily for about a week to a macaque weighing about 5 kgm. in order to eradicate an infection with *E. histolytica*. Such dosage was toxic to four of the five monkeys used.

The general conclusion drawn by the authors is that emetine affects the various intestinal protozoa of *M. sinicus* and *M. rhesus* exactly as it does the comparable species in man ; and it is suggested that macaques can therefore be utilized—if methods similar to the authors' be employed—in place of men in future chemotherapeutic experiments to discover remedies for human amoebic dysentery.

H. M. H.

BISHOP (Ann). **Experiments on the Action of Emetine in Cultures of** *Entamoeba coli.*—*Parasitology.* 1929. Nov. Vol. 21. No. 4. pp. 481–486. [5 refs.] [National Inst. for Med. Research, Hampstead, London.]

Two pure strains of *Entamoeba coli*, differing in their accompanying bacterial flora and experimental history, but identical morphologically, have been tested with emetine hydrochloride *in vitro*. In a buffered and wholly liquid medium, with a pH varying between 6·8 and 7·2 emetine hydrochloride was found to be toxic to *E. coli* in dilutions between 1 : 300,000 and 1 : 600,000, the toxicity increasing with the alkalinity of the medium. It is therefore concluded that emetine is about 16 times as toxic *in vitro* to *E. histolytica* as it is to *E. coli*.

H. M. H.

TRIPOLI (Carlo J.). **A Study of Stools cultured for *Endameba histolytica* for Diagnostic and Other Purposes.**—*Amer. Jl. Med. Sci.* 1929. Dec. Vol. 178. No. 6. pp. 822–833. [12 refs.] [Med. School, Tulane Univ. of Louisiana, New Orleans.]

Results of this investigation* lead the author to conclude that bacterial flora exert a very important influence on initial and later growth of amoebas in culture. It does not seem feasible to eliminate the accompanying bacteria entirely. There are multiple factors, each playing its own role, causing death of the amoebas in culture. Immunological reactions possible with cultured amoebas, and their extracts, promise valuable aid in diagnosis. His cultural method of stool examination for presence of *E. histolytica* was equal to any laboratory means of diagnosis, and may eventually prove superior to direct microscopy. In public health work the culture method would result in much saving of time and personnel in detection of *E. histolytica* carriers. From study of 258 private and dispensary patients, and medical students, it is estimated that incidence of *E. histolytica* infection in Louisiana is a little below 7 per cent.

H. M. H.

FRIEDRICHS (Andrew V.) & HARRIS (William H.). **Cultivation of *Entamoeba histolytica* from a Hepatic Amoebic Abscess.**—*Proc. Soc. Experim. Biol. & Med.* 1929. Nov. Vol. 27. No. 2. pp. 90–91. [3 refs.] [Med. College, Tulane Univ., New Orleans.]

The authors note that cultures from intestine may present a varied assortment of non-pathogenic amoebae. Thus about many of the reports of cultures there exists doubt as to the species of cultivated amoeba. Further DOBELL (1927) reports cultivation of an amoeba from different types of monkeys which he declares not to be differentiated from *Entamoeba histolytica* of man—of much importance in the consideration of experimental transmission of *E. histolytica* to such types of anthropoid animals. There is, however, very remote likelihood of an assortment of amoebae in the liver lesion.

The authors' patient suffered from amoebic dysentery and liver abscess. Liver pus obtained at operation revealed in stained smears and by culture no bacteria. The patient died 24 hours after operation. Fresh material scraped from liver abscess wall at autopsy (12 hours after death) showed many actively motile amoebae, identified by staining by Heidenhain's iron haematoxylin method. Cultures of this material were prepared in Dobell's modification of Boeck-Drbohlav medium. In some tubes the amoebae grew freely—30 generations in 5 months. Study of iron haematoxylin stained specimens revealed morphological features of *histolytica* species. The primary amoebic cultures made post-mortem from scrapings of liver abscess wall showed contamination, for most part with colon group bacteria. Bacterial invasion had therefore occurred post-mortem.

H. M. H.

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* This paper opens with half a page which is practically a verbal transcript from DOBELL and LAIDLAW (*Parasitology*, 1926, Vol. 18, p. 283). Later, under the heading "Differentiation of Pathogenic and Non-pathogenic Amebas Cultured," there is a transcript of two pages from St. JOHN (*Amer. Jl. Trop. Med.*, 1926, Vol. 6, p. 319) and later, another page-long transfer from DOBELL and LAIDLAW (*loc. cit.* p. 307). In each instance there is nothing to indicate that the passages in question are transcripts. The citing of these authors' papers in the Bibliography at the end cannot atone for these acts of plagiarism.—ED.

HARRIS (William H.) & FRIEDRICHS (Andrew V.). **Injection into the Rabbit of Cultures of** *Entamoeba histolytica.*—*Proc. Soc. Experim. Biol. & Med.* 1929. Nov. Vol. 27. No. 2. pp. 91–93. [4 refs.] [Med. College, Tulane Univ., New Orleans.]

The authors using as inoculum a culture of *E. histolytica* from a hepatic abscess [v. this *Bulletin* above] have failed to infect rabbits by injection of inoculum into mesenteric veins, directly into liver substance, or into marginal ear vein.

They note that the rabbit may not be susceptible to this infection.

H. M. H.

PONS (R.). Essais de mise en culture d'*Entamoeba dysenteriae* en partant du pus d'abcès hépatique d'origine amibienne. [**Attempts to cultivate** *E. dysenteriae* **from Hepatic Abscess.**]—*Bull. Soc. Path. Exot.* 1929. Nov. 13. Vol. 22. No. 9. pp. 768–770. [6 refs.]

Records the author's failure to cultivate *E. histolytica* from the pus of liver abscess. Conditions for success appeared favourable, for in the liver pus (obtained by surgical intervention) of each of 5 cases of hepatic abscess many actively moving haematophagous amoebae were found, and their nature determined by wet fixation and differential staining with iron haematoxylin. In two cases there was bacterial contamination of the pus; in the other three it was bacterially sterile. The amoeba-bearing pus was sown on to medium proved to be successful in cultivation of *E. histolytica* from faeces, and the temperature and pH conditions were exactly those which experience had shown to be right for that cultivation. The anaesthetic given the patients (ether and chloroform) could be ruled out, for the amoebae in the pus remained active for several hours after the pus was drawn from the patient. The author suggests that the amoebae in (and from) intestine are not strictly adapted to parasitism; hence their cultivation is easy in comparison with amoebae from liver tissue which are probably strictly adapted to parasitism. In support he notes how seldom *E. histolytica* in culture is phagocytic of red blood cells; they have lost parasitic qualities.

H. M. H

TANABE (Misao) & CHIBA (Eiichi). [**On a New Method of Cultivation of Dysentery Amoeba.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1928. Aug. No. 2586. [Summarized in *Japan Med. World.* 1928. Dec. 15. Vol. 8. No. 12. p. 325.]

The medium slant consists of mixture of Ringer's solution (NaCl 9·0, $CaCl_2$ 0·2, KCl 0·2, Aq. dest. 1000); agar-agar 10 gm.; asparagin 1·0 gm. Ringer's solution and 5 per cent. rabbit's serum is added—just up to the top of the slant. Immediately before inoculation the medium is sterilized at 160–180° C. for one hour; and to 2 or 3 platinum-loopfuls of rice powder are added. The medium is then warmed in incubator at 37° C., inoculated with platinum loopfuls of infected faeces, and cultivated at 37° C. In this medium the amoebae live and proliferate vigorously for 12–14 days. The pH of the medium at the beginning is 7·8, but with proliferation of amoebae it becomes 6·4. Sub-inoculations proved successful.

H. M. H.

CRAIG (Charles F.). **The Technique and Results of a Complement Fixation Test for the Diagnosis of Infections with** *Endamoeba histolytica.*—*Amer. Jl. Trop. Med.* 1929. Sept. Vol. 9. No. 5. pp. 277–296. [14 refs.] [Army Med. School, Washington.]

The author fully describes his preparation of the alcohol extract of amoebic antigen and the exacting technique of the test proper. He

warns that the test requires a trained serologist, as the use of the undiluted alcoholic extract of *E. histolytica* (cultures) as antigen, renders the test one subject to extreme error unless the exact technique be followed. Results, moreover, ought to be checked by cultures and examination of faeces by one competent in the differentiation of the various species of amoebae occurring in man's intestine. As the antigenic extract used in this test was prepared from cultures of *E. histolytica*, which were in fact, mixed cultures of that parasite and various bacteria, the author prepared antigen extracts in like manner of the bacteria growing in the cultures, both aerobic and anaerobic, and used them as controls.

623 blood sera from as many individuals were tested, checked in each instance by microscopical and cultural examination of the respective faeces for *E. histolytica*. 67 (10·7 per cent.) gave a positive (three or four plus) reaction, and 556 (89·2 per cent.) gave a negative reaction. Of the 67 positives, the faeces examination revealed *E. histolytica* in 61 (91 per cent.), and none in 6 (8·9 per cent.). *Clinically*, over 60 per cent. of the serum positives presented clinical symptoms that may have been caused by *E. histolytica* infection. Disappearance of *E. histolytica* after appropriate treatment was followed by disappearance of symptoms, and in 3 to 6 weeks by conversion of serum reaction from positive to negative.

Of the 556 serum negatives, faeces were found positive for *E. histolytica* in 5. Of these one had severe symptoms of amoebic dysentery, one was a case of amoebic hepatic abscess, two had slight symptoms which may have been caused by the parasite, and one was a "healthy carrier." In 121 of the individuals giving negative serum reaction (21·7 per cent.) some species of amoeba other than *E. histolytica* was present in faeces; it was evident, therefore, that these other amoebae do not cause a positive serum reaction, and this was found true also of intestinal flagellates. Further observations [here reported fully] served to show that in rare instances cases giving positive Wassermann and Kahn test would also give positive reaction with this test. The author states that in patients giving such reactions, and in whom *E. histolytica* cannot be demonstrated in the faeces, the positive reaction with this test should not be regarded as diagnostic.

"Clinically, and as checked by the microscopic and cultural examination of the feces, the test would appear to possess a high degree of specificity and its use in hospital practice has proven its value, time and again, in demonstrating amoebic infections that would otherwise have remained unrecognized."

H. M. H.

GEMAR (Frank). **Effects of Bacteriophage upon Cultures of** *Entamoeba histolytica*.—*Proc. Soc. Experim. Biol. & Med.* 1929. Nov. Vol. 27. No. 2. pp. 95-97. [3 refs.] [Med. College, Tulane Univ. & Lab. of the Veteran's Hosp. 84, New Orleans.]

Though varying amounts of a bacteriophage of considerable potency were introduced into the amoebic cultures, in no instance was interference with the amoebic growth manifested. Definite inhibition of bacterial growth was often demonstrated, but for a short time only; bacterial growth recovered and became even luxuriant. It is to be noted, however, that the phage had been proved potent for bacteria other than those predominating in the amoebic culture.

H. M. H.

CHEREFEDDIN (Osman). Eine neue Methode zur Konservierung der Amöben. [**A New Method for Preservation of Amoebae.**]—*Deut. Med. Woch.* 1929. June 28. Vol. 55. No. 26. pp. 1084–1085.

The longer stools are kept before examination, the greater the difficulty in finding and identifying amoebae in them, an unavoidable disadvantage where samples of stools have to be sent to distant laboratories for examination. The author has found Bouin solution an excellent preservative. It consists of formalin 40 per cent., 10 gm.; acetic acid 2 gm.; aq. dest. 30 gm.; picric acid to saturation. 0·5–1 cc. of this solution is well mixed with 3–5 cc. of stool, preferably the blood and mucus in the stool; the container, or test-tube, can be closed by rubber or ordinary cork. In this mixture the amoebae retain their form for over 10 days; endo-and ectoplasm, and nuclear structure remain distinct; furthermore, they can be stained with iron haematoxylin.

H. M. H.

OGAWA (Juntaro). Ueber die Reaktion der Gewebe. IV. Mitteilung: Studien ueber intrazelluläre Wasserstoffionenkonzentration der *Entamoeba histolytica* und *Entamoeba coli.* [**Intracellular H Ion Concentration of** *E. histolytica* **and** *E. coli.*]—*Zent. f. Bakt.* I. Abt. Orig. 1929. Sept. 28. Vol. 114. No. 1/2. pp. 68–81. [7 refs.] [Med. Clinic, Imperial Univ., Tokyo.]

The technique of this painstaking research, and its results, are carefully and fully set out in a long paper, which cannot usefully be summarized. Its interest appears chiefly to be for those austere, and still esoteric, circles of cytologists and parasitologists whose bent and habit is bio-chemical, on whom, however, are placed the modern hopes of hygienist and clinician.

H. M. H.

SCHRUMPF-PIERRON. Die chronische, periodisch aufflackernde Amöben-Hepatitis. [**Chronic, Periodically Relapsing, Amoebic Hepatitis.**]—*Klin. Woch.* 1929. Aug. 13. Vol. 8. No. 33. pp. 1542–1543.

An interesting account breaking no new ground.

H. M. H.

GASTON, OLMER (Jean) & AMÉDÉO. Cirrhose amibienne avec ascite hémorragique terminale. [**Amoebic Cirrhosis with Terminal Haemorrhagic Ascites.**]—*Marseille-Méd.* 1929. June 25. Vol. 66. No. 18. pp. 876–877.

The diagnosis in this case was clinical.

H. M. H.

BACILLARY DYSENTERY.

CHARLES (J. A.) & WARREN (S. H.). **Bacillary Dysentery in an Industrial Area.**—*Lancet.* 1929. Sept. 21. pp. 626–631. [11 refs.]

The authors describe fully clinical, epidemiological, pathological and bacteriological observations on 111 positive and 80 suspected cases of dysentery admitted to the Hospital for Infectious Diseases, Newcastle-upon-Tyne between March, 1928, and June, 1929. From consideration of these data they conclude that bacillary dysentery is a relatively common disease. Their experience, together with that of NABARRO and Glasgow and Aberdeen observers, suggests that in

certain areas it is undoubtedly endemic. Mild, severe, and fatal cases are all to be met with; they conform to the classical types of the disease. Its seasonal incidence is not limited to the warmer months of the year; and for this reason and because of its low attack rate and still lower mortality rate among children under 2 years old, it does not appear to have any definite association with the infective summer diarrhoea of infants. Six different organisms belonging to Flexner, Sonne, and Newcastle groups of dysentery bacilli were found associated with the disease. It is not improbable that in other areas the prevailing types may be different.

H. M. H.

TRABAUD, KHAIAT (Hamdy) & SABBAGH (Abdel-Kader). La dysenterie bacillaire en Syrie. [**Bacillary Dysentery in Syria.**]—*Rev. Prat. Malad. des Pays Chauds.* 1928. Oct. Year 7. Vol. 8. No. 10. pp. 515–521.

The authors give clinical and bacteriological data of five cases of dysentery. They conclude that bacillary dysentery in Syria occurs more often sporadically than in epidemics. The infection is that of Flexner type bacterium; it is not imported, for the common bacillary dysentery of France is due to Shiga type bacterium, and when exceptionally due to a Flexner type is not a severe illness, in contrast to what occurs in the Levant. The illness as observed in Syria is severe, due to unusual toxic properties of the Flexner bacterium. As introduction the authors state that it is unquestionable that amoebic infection accounts for the great majority of cases of dysentery in Syria. [This is, however, questionable.]

H. M. H.

VIEIRA (F. Borges). Das dysenterias na cidade de S. Paulo. [**Dysentery in S. Paulo.**]—*Sciencia Med.* 1929. Dec. Vol. 7. No. 12. pp. 609–632. With 1 map & 6 charts. [Hyg. Inst., S. Paulo.]

In this article the author takes up the detailed study of 133 cases, of which the facts are known and where the mortality was 24·06 per cent., according to geographical distribution, age, segregation, nationality, sex and origin of infection. He concludes that dysentery is endemic in S. Paulo, and that much improvement could be brought about by notification of all cases of suspicious diarrhoeas.

W. F. Harvey.

HAY (Hilda R.). **Fatal Epidemic Enteritis due to** *B. dysenteriae Sonne*: **a Preliminary Report.**—*Glasgow Med. Jl.* 1930. Jan. Vol. 113. No. 1. pp. 25–28. [11 refs.]

This preliminary report is based on an outbreak of acute enteritis in a hospital, and is to be fully dealt with later in another journal. It adds one more to the accounts of Sonne dysentery infection in Great Britain and was remarkable on account of the high fatality rate with which it was associated.

W. F. Harvey.

ABRAHAM (G.). Besonderheiten der Dysenterie Kruse-Sonne im Kindesalter. [**Peculiarities of Kruse-Sonne Dysentery in Children.**] —*Monatssch. f. Kinderheilk.* 1929. Dec. Vol. 45. No. 5. pp. 385–393. With 2 curves. [6 refs.] [Children's Clinic, Univ., Frankfurt a. M.]

Seventy cases were available for study, and in only 3 of these were bacilli not found. Agglutination tests are not of much value in diagnosis, as the reaction is slight with either of the two colony forms exhibited by this organism. A diagnosis of dysentery can be made from inspection of the stools alone, which show blood and abundant mucus. A very important difference has been found in regard to the disease as it occurs in infants and young children respectively. The former, except for a typical dysentery stool, show no severe symptoms: there is practically no elevation of temperature and no toxic manifestations. Young children, on the other hand, present a typically severe onset with temperature rising to 38°–40° C. (100·4° to 104° F.); it falls on the following day, after the administration of castor oil, to normal. Toxic symptoms in the shape of unconsciousness, convulsions and delirium are present. These toxic manifestations have disappeared by the second day and the further course is always satisfactory.

W. F. Harvey.

JUNIOR (Martinho da Rocha). Considerações clinicas sobre as dysenterias bacillares no lactente e na primeira infancia. [**Clinical Observations on the Bacillary Dysentery of Infancy.**]—*Brasil-Medico.* 1929. July 13. Vol. 43. No. 28. pp. 787–795. [3 pages of refs.]

A questionary was issued, designed to ascertain the technique of faeces examination, the treatment of dysentery including serotherapy, vaccinotherapy, bacteriophage therapy and dietetic treatment. A difficulty arose as to what was to be called dysentery. The disease caused by Shiga-Kruse and Flexner organisms is well defined, but there is a large confused group besides, ascribed to pseudo-, para-, meta-dysentery organisms, etc., and there are the diseases associated with the presence of bacilli of Hiss Russell, Schmidt, Harris, Strong, Morgan, etc. Reference is made to the possible modes of spread of dysentery by flies and by temporary or permanent carriers, and by healthy carriers. Prognosis depends less on the nature of the germ than on the severity of the symptoms: Shiga dysentery may be benign, while the less toxic organisms may give rise to severe cases. The subject of treatment is discussed at some length, both symptomatic and specific treatment. Serum treatment has its special use where toxic symptoms are present—tachycardia, muscular twitching, hyperpyrexia, slow deep respiration, somnolence, etc. Vaccinotherapy, autovaccinotherapy, oral and rectal administration of vaccines are referred to, as are also bacteriophage and protein therapy.

W. F. Harvey.

CASTELLANI (Aldo). **"Metadysentery," with Remarks on a Chronic Type.**—*Lancet.* 1929. Aug. 24. pp. 370–372. [12 refs.]

The bacteriological description of the "metadysentery" species of bacilli has been given in numerous papers by the author. In this

paper attention is again drawn to the chronic type of the disease, "characterized by recurrent attacks of simple diarrhoea with absence or occasional presence of dysenteric symptoms."

W. F. Harvey.

BIGGAM (A. G.). **Peripheral Neuritis as a Complication of Bacillary Dysentery associated with Treatment by Antidysenteric Serum.**—*Jl. Roy. Army Med. Corps.* 1929. Nov. Vol. 53. No. 5. pp. 367–371. [5 refs.]

As introduction the author refers briefly to the work of various authors who have recorded polyneuritis in the course of bacillary dysentery or in convalescence from bacillary dysentery; and also polyneuritis following administration of antidysenteric sera.

The present case was that of a male, 35 years old, suffering from muco-sanguineous diarrhoea, pain, tenesmus. He had had similar yearly attacks for the previous 5 years. Flexner type dysentery bacterium was isolated from stools, and the patient's blood agglutinated that organism. Nothing abnormal noted in nervous system. Stools negative for cysts and vegetative forms of *E. histolytica*. Sigmoidoscopy showed rectum and pelvic colon diffusely red, congested, inflamed, muco-pus sticking to gut wall. Treatment—diet; soda sulph.; antidysenteric serum intramuscularly, 100 cc. first day, 60 cc. on each of four following days. Dysentery symptoms disappeared, but 8 days after admission to hospital patient complained of numbness in feet, which spread to knees, with pain and tenderness in calves. Five days later loss of superficial sensation up to knees and knee and ankle jerks absent; marked weakness of legs. No plantar response. No bladder or bowel trouble. Abdominal and cremasteric reflexes present. In upper limbs, only numbness of finger tips. Skin of feet, especially soles, became very glossy and sweated profusely. No urticaria or joint pains developed. 100 cc. antidysenteric serum diluted with saline was given intravenously, followed by 80 cc. by same route on each of next two days. No reaction. Sensation began to return in legs; finally, complete recovery, with no sign of neuritis.

The author's opinion is that the rapid improvement in the peripheral neuritis that followed on large doses of antiserum intravenously indicates that the neuritis was result of the dysentery toxins, and not of the antiserum given in the early stages of the acute bowel condition.

H. M. H.

COMPTON (Arthur). **Antidysentery Bacteriophage in the Treatment of Bacillary Dysentery. A Record of Sixty-Six Cases treated, with Inferences.**—*Lancet.* 1929. Aug. 10. pp. 273–275. With 2 text figs. [8 refs.]

The therapeutic phage was prepared by putting up a mixture of 4 phage strains against 16-hour broth cultures of 2 Shiga, 3 Flexner, 6 Hiss (including one Sonne) and one Gay strain. Complete lysis was attained in a few hours at 37° C. The lysates, after 24 hours' incubation, were mixed, filtered through infusorial earth and an L3 Chamberland candle, and distributed in ampoules in quantities of 2 cc. Each patient received 3 ampoules and a circular of instruction on the use of the phage. Returns, which could be used, were obtained in 66 cases and showed that the results were very good in 35, good in 10, moderately good in 6, a partial failure in 10.

W. F. Harvey.

CLAYTON (F. H. A.) & WARREN (S. H.). **A Further Study of an Unusual Bacillus recovered from Cases presenting Symptoms of Dysentery.**—*Jl. Hygiene.* 1929. July. Vol. 29. No. 2. pp. 191–200. [6 refs.] [College of Med., Univ. of Durham, Newcastle-upon-Tyne.]

The occurrence of this bacillus in cases of dysentery has already been described [see this *Bulletin*, Vol. 26, p. 894]. It has been found in two further cases. An investigation into the specific characters of this associated organism strengthens the impression that it is a hitherto unrecognized dysentery bacillus, which the authors propose to call the "Newcastle dysentery bacillus."

W. F. Harvey.

CALALB (G.). Sur la variabilité microbienne au cours d'une infection (dysenterie bacillaire). [**Variability of the Dysentery Bacillus in the Course of the Disease.**]—*C.R. Soc. Biol.* 1929. Oct. 18. Vol. 102. No. 26. pp. 162–164.

Two cases of dysentery were treated, the one with antidysentery serum, the other with antidysentery bacteriophage. In both cases the strain of bacillus isolated showed marked change with the institution of the particular treatment.

W. F. Harvey.

HILGERS (Paul). Ueber E-Ruhr-(Kruse-Sonne-) Bazillen. [**E-Dysentery (Kruse-Sonne) Bacilli.**]—*Zent. f. Bakt.* I. Abt. Orig. 1929. Oct. 31. Vol. 114. No. 4/6. pp. 320–333. With 1 text fig. [35 refs.] [Reich Health Office, Berlin-Dahlem.]

The importance now attached to the type of dysentery bacillus which goes by the name of the Sonne bacillus has also brought into more prominence the series of so-called pseudodysentery bacilli which were previously differentiated by KRUSE and his co-workers: these were not distinguishable by simple agglutination tests, but were differentiated by means of serum-absorption tests and were given the name letters A to H, with the addition later of the J type (Schmitz bacillus). In this series the E-type of Kruse has been found to be identical with the Sonne bacillus.

An investigation has been made by the author of the distinguishing characters of the Kruse-Sonne bacillus which are set out in this paper in detail.

W. F. Harvey.

DE ASSIS (A.) & MENDES (Nelson O.). Estudos sobre o bacillo para-dysenterico de Kruse-Sonne. [**Studies on the Paradysentery Bacillus of Kruse-Sonne.**]—*Brasil-Medico.* 1929. Aug. 31. Vol. 43. No. 35. pp. 1031–1037. With 6 text figs. [33 refs.]

The authors review the work done on the Kruse-Sonne bacillus and refer to the countries in which it has been reported as the cause of a form of dysentery. Their own work has consisted in a comparison of 3 strains obtained from muco-purulent dysentery stools of children in Nictheroy and Rio de Janeiro with 3 well-accredited European strains.

W. F. Harvey.

DE ASSUMPÇÃO (Lucas). Notas sobre a fermentação tardia e phenomeno de "caméléonage" com bacillos dysentericos. [**Slow Fermentations and "Cameleonage" of Dysentery Bacilli.**]—*Brasil-Medico.* 1929. Oct. 5. Vol. 43. No. 40. p. 1195. English summary pp. 1195–1196.

Late fermentation of sugars, that is, in 3 to 9 days, was observed very frequently with strains of Shiga and Y bacilli but only rarely with Flexner strains. Such late fermentation was principally of saccharose, to some extent of maltose and much less frequently of mannite and maltose. "Cameleonage" was observed in the case of late fermenters especially with saccharose but sometimes with maltose. By the term "cameleonage" is understood a reversion of the fermentation colour of a culture (semi-solid) to the original alkaline or neutral colour, when removed from the incubator to be kept at room temperature, and a restoration of its acid or fermentation colour when returned to the incubator.

W. F. Harvey.

WILLETT (Joseph C.). **The Application of the Twort-d'Herelle Phenomenon in the Diagnosis of Shiga Dysentery.**—*Jl. Lab. & Clin. Med.* 1929. Oct. Vol. 15. No. 1. pp. 83–84. [4 refs.] [Health Division Labs., St. Louis, Mo.]

The principle investigated was the use of a specific bacteriophage test for the identification of atypical dysentery cultures. Four such cultures had been met with in field work. Broth cultures were inoculated with anti-Shiga phage and showed complete lysis after 24 hours' incubation, as also did a stock strain of Shiga. Controls were set up at the same time in the shape of cultures of *Bact. typhosum* and cultures which contained no bacteriophage. The confirmation that the organisms thus identified were Shiga-dysentery was given later, when the originally atypical test strains became typical with further culture. None of the cases from which the organisms were derived showed clinical evidence of dysentery.

W. F. Harvey.

DE ASSIS (A.), Ueber die Shiga-Toxoide und ihre Verwendung in der Herstellung antitoxischer Dysenteriesera. [**Shiga Toxoids and their Use in the Procural of Antitoxic Dysentery Sera.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 64. No. 1/2. pp. 49–60. With 1 text fig. [14 refs.] [Vital Brazil Inst. Nictheroy, Brazil.]

The experiments carried out were to some extent in continuation and confirmation of previous experiments. These had shown that a 0·25 per cent. formol produced a definite reduction in the potency of a bouillon Shiga toxin after 3 days at 37° C. It has now been shown that even in a concentration of 1 per cent., acting for 30 days at 37° C., the potency of the toxin is not yet completely annulled. Formol has precisely the same detoxicating action upon a suspension of bacilli in normal salt solution as it has upon the bouillon toxin. In these experiments an observation period of at least 15 days in rabbits must be allowed for the estimation of toxicity. Bacillary toxoid, as the formolized bacillary suspension is called, was used as antigen in horses by subcutaneous injection and furnished a satisfactory antiserum. Still better results were obtainable by addition of a tapioca suspension to the bacillary toxoid. These showed themselves by a more rapid production of a more potent antiserum. The local reaction was always considerable.

W. F. Harvey.

OKELL (C. C.) & BLAKE (Adelaide V.). **Dysentery Toxin (Shiga): Notes on its Preparation with a Discussion of its Position as an Endotoxin.** —*Jl. Path. & Bact.* 1930. Jan. Vol. 33. No. 1. pp. 57–63. [14 refs.] [Wellcome Physiol. Research Labs., Beckenham, Kent.]

Three varieties of toxin: (1) dried Shiga bacilli; (2) filtrate; and (3) precipitated filtrate toxin have given consistent results. The medium for the preparation of filtrate toxin is made by adding 10 gm. Chapoteaut peptone and 5 gm. sod. chloride to 1 litre of bullock's heart extract, adjusting pH to 7·8 and sterilizing. One litre amounts of this medium are filled into 4 litre bottles and sown with 5 to 10 cc. of an overnight culture of Shiga's bacillus. Toxin is obtainable in about 14 days, when the reaction has reached pH 8·6 to 8·8, by filtration through a Berkefeld candle (N). Phenol (0·5 per cent.) may be added if the toxin is only to be used for horse immunization. The product is of high toxicity and should kill 100 per cent. of the test mice by intravenous injection in doses of 0·005 to 0·01 cc. Toxoid is prepared from the filtrate toxin by the addition of 0·6 per cent. formaldehyde. After 3 weeks at 37° C. the original toxin, which had killed mice in doses of 0·005 cc., is usually innocuous in doses of 1 cc. A horse immunized with such toxoid yielded a serum of over 2,000 international units after only 6 weeks' treatment.

That the toxin is a true endotoxin appears evident from the fact that the bacillary bodies are found to be fully toxic for mice after 16 hours' incubation, at which time growth is at its height, and yet there is no detectable toxin in the filtrate. If dysentery toxin is, on the evidence, to be classed as an endotoxin, it still resembles the exotoxins, such as diphtheria, in the specificity of its toxophore and haptophore groups and in its ability to give rise to potent and specific antitoxin when injected into animals.

W. F. Harvey.

YASUI (Kehnosuke). Ueber das heterogenetische Antigen in Shiga-Bazillen. [**Heterogenetic Antigen in Shiga Bacilli.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 63. No. 5/6. pp. 440–451. [15 refs.] [Cancer Research Inst., Heidelberg.]

A number of authors have demonstrated the presence of Forssman heterogenetic antibodies in the serum of rabbits immunized with Shiga bacilli. But, it is contended, this does not prove that Forssman antigen is contained in the bacilli, for they may only have supplied a non-specific stimulus to an increase of Forssman antibody already contained in rabbit serum. It has not been possible to obtain Forssman antigen by alcoholic extraction of lipoids from dysentery bacilli.

The author has used two strains of Shiga dysentery bacilli, No. 1 and No. 2. Eight out of 11 rabbits which survived immunization with killed bacilli of No. 1 strain furnished a serum which was haemolytic for sheep erythrocytes in greater or less degree, while the sera of the 3 rabbits immunized with No. 2 strain showed complete absence of haemolytic action. One may assume, therefore, that No. 1 strain supplied a specific stimulus to the increase of the haemolytic titre. That this is really a stimulus to the production of heterogenetic Forssman antibodies is likewise brought out by positive complement fixation and flocculation serum reactions of the dysentery antiserum with alcoholic extracts of the organs of those animals which contain heterogenetic Forssman antigen. On the other hand, complement fixation, absorption and flocculation experiments to demonstrate the presence of Forssman antigen in the Shiga bacilli by

direct test—that is, by test for the antigen itself with Forssman antisera—have failed. This failure is difficult to explain. Still it would seem to be demonstrated by the very different action of these No. 1 and No. 2 strains that some Shiga dysentery bacilli do contain heterogenetic Forssman antigen and that it is specific.

W. F. Harvey.

VAZ (Eduardo). Prophylaxia especifica da dysenteria bacillar. [**Specific Prophylaxis of Bacillary Dysentery.**]—*Sciencia Med.* 1929. Nov. Vol. 7. No. 11. pp. 533–540.

The author is a warm supporter of the oral administration of dysentery vaccine both for prophylactic and curative purposes (see this *Bulletin*, Vol. 25, pp. 627 & 629). The importance of effectively immunizing a population which is backward in its attention to common sanitary precautions is undeniable. Again the author insists emphatically upon a periodic survey according to regions and districts of the prevalence of diseases due to particular organisms. A regional index of incidence should be set up and the prophylactic vaccine used in any particular locality would have its proportional bacillary composition determined by that index.

The vaccine itself is prepared by culture of the several organisms in separate flasks of bouillon for 3 weeks at 37° C. with formolization at 0·25 per cent. Mixtures of organisms are made up to provide vaccine with a composition proportional to the regional index of the different bacilli. The vaccines are used regionally at the beginning of each summer, when diarrhoea becomes prevalent, in prophylactic doses of 30 to 60 cc. on 3–4 successive days.

W. F. Harvey.

DE ARAUJO (Eduardo) & TORRES (Octavio). Resultados da vaccinação antidysenterica "per os." Observações feitas na Bahia. [**Results of Antidysenteric Vaccination by the Mouth.**]—*Sciencia Med.* 1929. Dec. Vol. 7. No. 12. pp. 604–608.

The vaccine consisted of broth cultures of strains of dysentery and paradysentery which had been incubated for 21 days and to which 2·5 cc. formol were added per litre for sterilization purposes. Of 274 persons receiving the vaccine and kept under observation for 10 months, not one contracted dysentery, whereas five cases of bacillary dysentery and one of amoebic occurred among 38 controls.

W. F. Harvey.

DE ARAUJO (Eduardo). Da immunisação activa por via oral e sua utilidade pratica, especialmente contra a dysenteria bacillar. [**On Active Oral Immunization and its Practical Utility, especially against Bacillary Dysentery.**]—*Sciencia Med.* 1929. Dec. Vol. 7. No. 12. pp. 633–648. [53 refs.]

This article gives very extensive data of the use of vaccines by oral administration, and of the advantages which this method possesses over subcutaneous inoculation. The author considers that such vaccines and the keratinized bile pills which are required for use along with them should be produced in state laboratories; they are easy to prepare, and should be distributed free.

W. F. Harvey.

WALKER (W.) & WATTS (R. C.). **Dysentery Prophylaxis by Oral Bilivaccin at Poona and Secunderabad.**—*Indian Jl. Med. Res.* 1929. July. Vol. 17. No. 1. pp. 183–190. [2 refs.]

This paper gives full details of the authors' careful observations. MANIFOLD's investigation, they note, revealed that in Poona the great majority of dysentery cases were bacillary and that Bact. Flexner was the most frequent infecting organism. They have tested the efficacy of bilivaccin as prophylactic against bacillary dysentery in British troops in Poona and Secunderabad. The total number so "protected" was 1,400 out of a total of 5,080, i.e., 27·6 per cent. They found that oral bilivaccin failed as a prophylactic against bacillary dysentery; and the clinical course of the disease did not appear to be modified in individuals who had been given the vaccine. The bilivaccin was that prepared by the Biotherapie Co., Paris, according to the researches of Professor BESREDKA.

H. M. H.

SMITH (F. Lewis). **The Means of Spread and Method of Control of Bacillary Dysentery.**—*Jl. Roy. Nav. Med. Serv.* 1929. Oct. Vol. 15. No. 4. pp. 253–277. [54 refs.]

An interesting review of the subject.

H. M. H.

MIXED AND UNCLASSED DYSENTERY.

LARGE (D. T. M.). **Dysentery in the Lahore Military District.**—*Jl. Roy. Army Med. Corps.* 1929. Nov. Vol. 53. No. 5. pp. 334–343. With 2 charts in text. [9 refs.]

A careful and valuable investigation revealing that:—

"(1) Bacillary dysentery in Lahore military district is very much commoner than amoebic, forming some 80 per cent. of the total dysentery.

"(2) Dysentery in Lahore district, while present throughout the year, increases markedly in incidence in the warm months prior to the real hot weather and immediately following it.

"(3) Bacillary dysentery has been almost invariably very mild in type in the years 1925 to 1927, even in the case of Shiga infections. Some cases of Flexner infection had only one day's diarrhoea with blood and mucus in the stools.

"(4) Bacillary dysentery in Lahore district is grouped into that due to *B. dysenteriae* Flexner 74·1 per cent.; *B. dysenteriae* Sonne 13·3 per cent. and *B. dysenteriae* Shiga or Schmitz 12·6 per cent. . . .

"(6) Agglutination tests in the case of dysentery require incubation for sixteen hours at 56° C. It was found convenient to leave them overnight in the water-bath.

"(7) The diagnosis of Sonne dysentery requires a high titre serum made from a circular smooth colony of this organism, or preferably two sera, one from the circular smooth early form and another from the crenated late form.

"(8) An originally large group of inagglutinable Flexner organisms was found on retention for a year in the laboratory to have become agglutinable to a small extent with Flexner sera and then to have become capable of producing a serum which agglutinated various bacilli of the Flexner group, in some cases to high titre."

H. M. H.

KRISHNAMURTY (Ch.). **Dysentery in the Central Jail, Rajamandry, Madras Presidency.**—*Indian Med. Gaz.* 1929. Dec. Vol. 64. No. 12. pp. 679–681. With 6 charts.

In this jail careful investigation of stools gave :—

Year.	Amoebic. per cent.	Bacillary. per cent.	Mixed.	Case mortality. per cent.
1927	5·5	94·5	—	8
1928	10·0	88·4	1·6	2

The disease was spread chiefly by flies. Its incidence was directly proportional to the fly prevalence. Most cases occurred in January, after which it abated gradually, until it was almost absent in April; it commenced again in July, and waned in November. Shiga and Flexner type dysentery bacteria were present throughout the year; they were least virulent in summer.

H. M. H.

UKIL (A. C.). **The Dysenteries in Bengal.**—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 2. pp. 239–245. With 1 chart. [9 refs.] Also in *Calcutta Med. Jl.* 1928. June. Vol. 22. No. 12. pp. 627–636. With 1 chart. [9 refs.]

The author states that one-fifth of the total number of deaths in Calcutta are due to dysenteries, whereas cholera carries away half that number. Nearly a century ago Norman CHEVERS recorded that three-quarters of the total deaths amongst the lower orders of Indians were due to diarrhoea.

H. M. H.

MAITRA (Jitendra Nath). **Combined Amoebic and Bacillary Dysentery in Calcutta (Preliminary Paper).**—*Calcutta Med. Jl.* 1929. Sept. Vol. 24. No. 3. pp. 109–110.

In this—preliminary—paper the author records that in course of necropsy work he has often observed that the mucous membrane of the colon in between typical amoebic ulcers might have the appearance of a superficial necrosis characteristic of bacillary dysentery. Microscopical examination of sections has not been satisfactory—owing mainly to the fact that autopsy was performed more than 24 hours after death. He has therefore carried out a series of fresh stool examinations, by direct microscopy of wet fixed and stained specimens and by culture, and also by agglutination test of the bacteria obtained by culture. He has thus obtained Shiga or Flexner type bacteria from the stools, in which he has also found "moving amoebae histolytica and cysts, cysts alone and with flagellates."

H. M. H.

LEE (Shih-wei). **Dysentery complicating Pregnancy and the Puerperium.**—*China Med. Jl.* 1929. July. Vol. 43. No. 7. pp. 666–678.

This paper embodies the author's observations in 38 obstetrical cases in Peking. Twenty-eight were bacillary dysentery, five amoebic, three double infection, and two were cases of amoebiasis. Of these

eight developed their dysentery after delivery. The author's conclusions are that the commonest time for pregnant women to contract dysentery is during the eighth and ninth months of pregnancy. Premature labour is the outstanding liability in pregnant women contracting dysentery, and is likely to occur if the dysentery is not properly treated during the first week of the disease.

H. M. H.

TAKEDA (S.). Dosage du sucre du sang dans la dysenterie des enfants. [**Estimation of Blood Sugar in Dysentery of Children.**]—*Oriental Jl. Dis. Infants.* 1929. Mar. Vol. 5. No. 2. [In Japanese. French summary pp. 17–18.] [Pediat. Inst., Imperial Univ., Kyoto.]

The investigation was carried out on 119 children fasting, and on several occasions during the dysentery attack. It was found that there was a light hypoglycaemia on the first day of the illness. On the second and third days the blood sugar was normal. Up to the 19th day large oscillations above and below the normal occurred—indicating that the dysentery destroyed the power to control the quantity of sugar in the blood. The hypoglycaemia at the onset of illness cannot be attributed to effect of vomiting, nervous symptoms, hunger, etc.; it may be result of impairment of glycogenic function of liver by the dysentery toxin.

H. M. H.

GOLDIE (H.). Remarques sur la cytologie des selles. [**Notes on the Cytology of the Stools.**]—*Bull. Soc. Path. Exot.* 1929. June 12. Vol. 22. No. 6. pp. 424–431. [14 refs.]

A good résumé of the views of various authors on the differential cytological characters of the stools in bacillary and amoebic dysentery is given, which may be summed up as: (1) Polynuclear and macrophage preponderance, degeneration (toxic) of cells as a whole giving rise to "ghost cells" in bacillary dysentery, (2) lymphocyte preponderance, degeneration (proteolytic) of cells at their circumference, great segmentation of nuclei of polynuclears, agglutination of red blood cells and presence of Charcot-Leyden crystals in amoebic dysentery. The next point considered is the information afforded by a special staining mixture in which neutral red and flavine serve to stain the living cells and basic fuchsin the dead cells. The formula is: 10 per cent. neutral red 1 to 2 drops; 2 per cent. flavine 5 drops; 2 per cent. basic fuchsin 2 to 3 drops; distilled water 5 cc., and this should be made up at the time of use from the several watery solutions. Living cells absorb first the flavine then the neutral red. Degenerated or necrotic elements take the fuchsin. Neutrophiles and lymphocytes stain clear yellow. In the macrophages the protoplasm is rose pink, the nucleus yellow, the granules red-yellow and the vacuoles, if present, yellow. Living epithelial cells show up in various shades of yellow and necrotic endothelial elements red. With the death of the cells the number which take the red stain increases: nuclei change from clear yellow to brown and finally red. Amoebae, even non-dysenteric amoebae are stained a very pale yellow and show red granules. Cysts do not stain. Flagellates stain just as do amoebae but retain their vitality for a long time. Blastocystis is stained intensely in different shades of yellow. Spores of fungi are coloured yellow and their mycelium red.

W. F. Harvey.

PACHECO (Genesio) & FIALHO (Amadeu). Exame do exsudato intestinal na dysenteria bacillar. [**The Examination of the Exudates in the Stools of Bacillary Dysentery.**]—*Sciencia Med.* 1929. Sept. Vol. 7. No. 9. pp. 452–455. [3 refs.] English summary p. 456.

The character and number of cells which are present in films made from stools are a valuable aid to diagnosis. The differential cell picture obtained is called—after ALEXEIEFF (this *Bulletin*, Vol. 25, p. 240)—a "pyogram." In amoebic dysentery the cellular elements are few and mononucleated, in bacillary dysentery numerous and polymorphonuclear. The exudate was examined in 28 cases of suspected dysentery, 15 of which proved by culture to be positive bacillary dysenteries. The pyogram in bacillary dysentery cases, according to ALEXEIEFF, is given as 97 to 98 per cent. neutrophiles, 1 to 2 per cent. eosinophiles and a few plasmophages [macrophages]. The authors, however, found in their cases that plasmophages were sometimes present in large numbers and always in greater number than the eosinophiles. In the non-dysenteric group the eosinophiles were more numerous than the plasmophages and so were the monocytes when present.

W. F. Harvey.

KHALED (Zaki). **The Use of the Sigmoidoscope in the Laboratory Diagnosis of Dysentery and Colitis.**—*Jl. Egyptian Med. Assoc.* 1929. Nov. Vol. 12. No. 9. pp. 163–168. With 1 text fig.

The sigmoidoscope, states the author, is so simple to handle, so harmless to use (within certain limits), and at the same time such a valuable help in the examination of chronic intestinal troubles that it should find a place in every clinical laboratory. He has found that sigmoidoscopy before examination of stools eliminates all affections simulating true dysentery—e.g., cancer, polypus, bilharzia, tuberculosis. If the stools are positive for amoebic or bacillary dysentery, it reveals the intensity of the lesions, allows of tracing their evolution and making a prognosis, and of observing result of treatment. If the stools are negative, material can be obtained direct from the bowel wall, and may alter the negative to a positive finding, and if this be still negative the pathogenic change in bowel wall can be identified. A double examination should always be made of the enema or laxative stool, and of a swab obtained direct from the bowel wall. [A scraping is still better.]

H. M. H.

MÜHLENS (P.). **Eight Years' Experience of Yatren in the Treatment of Amoebic and Bacillary Dysenteries and their Sequelae.**—9 pp. Lecture delivered before the International Congress for Tropical Medicine and Hygiene at Cairo, 15–22 December, 1928.

——. Huit années de traitement de l'amibiase et de la dysenterie bacillaire.—*Rev. Prat. Malad. des Pays Chauds.* 1929. May. Year 8. Vol. 9. No. 5. pp. 224, 227–230, 233–236, 239–242, 245.

A review [in much greater detail in the French paper] of the author's own experience, and also of that of many other workers in various

countries whom he cites in his support. [Abstracts of all these papers have appeared in this *Bulletin*.] This eight years' experience leads him to conclude that "Yatren 105" *properly* employed is the best remedy at present for dealing with cases of chronic amoebic dysentery and its sequelae (ulcerative and membranous colitis, spastic constipation, etc.); it gives 70–100 per cent. real cures and that from a single course.

Many cases need the drug solely by mouth; others by rectal injection only; others again need both methods. In acute amoebic dysentery yatren acts specifically. The irritative diarrhoea is slight and tolerable if proper modifications in treatment are followed. Particularly gratifying were results of treatment of acute and chronic amoebic dysentery in chronic carriers exhibiting no symptoms, and in children. Clinical signs, *Entamoeba histolytica* and its cysts, all usually disappear within a few days of instituting yatren treatment. *E. coli*, *Endolimax nana*, Iodamoeba, *Balantidium coli*, and the *minuta* forms of *E. histolytica* soon cease, in most cases, to be discoverable after the giving of yatren.

Less certain and less lasting are its effects in Lamblia and Trichomonas infestations; they are better, however, in Blastocystis, Councilmania and Chilomastix.

In bacillary dysentery, in particular Shiga-Kruse infections and their sequelae, remarkable successes have been recorded.

From various quarters have come recommendations for the use of yatren *prophylactically* (2–4 [0·25 gm. each] pills a day twice a week) in districts where dysentery is endemic.

The non-toxicity of yatren in doses up to 10–12 gm. a day is generally recognized. Nevertheless, 1·5–3 gm. per os, or in enemata to be retained in bowel, nearly always suffices to attain sure therapeutic effect.

H. M. H.

SCHREIBER (Georges). Médecine préventive de la dysentérie. [**Prophylaxis of Dysentery.**]—*Rev. Prat. Malad. des Pays Chauds.* 1929. Oct. Year 8. Vol. 9. No. 10. pp. 478–482, 485–489. [17 refs.]

The author records briefly the reported successes [but none of the failures] of various therapy as preventives.

H. M. H.

AMENTA (S.). Un caso di epatite amebica a tipo subacuto non colliquato.—*Arch. Ital. Sci. Med. Colon.* 1929. June 1. Vol. 10. No. 6. pp. 256–261. English summary (5 lines) p. 261.

BHANDARKAR (P. R.). Acute Amoebic Dysentery treated by *Hedyotes auriculares*, N.O. Rubiaceae.—*Indian Med. Gaz.* 1929. July. Vol. 64. No. 7. p. 387.

DIMITRIJEVIĆ-SPETH (V.) & MAGOVCEVIĆ-SCHNEIDER (Dobrila). Ueber ein bewegliches Stadium der Dysenteriebakterien.—*Zent. f. Bakt.* I. Abt. Orig. 1929. Nov. 30. Vol. 114. No. 7/8. pp. 509–511. [Central Hyg. Inst., Belgrade.]

FRANCHINI (Giuseppe). Amebiasi bronchiale.—*Arch. Ital. Sci. Med. Colon.* 1929. July 1. Vol. 10. No. 7. pp. 289–292. With 1 text fig. English summary p. 292. [Inst. of Trop. Path., Univ., Bologna.]

GARCÍA ESPIN (José). Observaciones y estudios sobre disenterias y amebiasis.—*Semana Méd.* 1929. Sept. 12. Vol. 36. No. 37 (1861). pp. 801–805. [General Hosp., Granada.]

MACDONALD (Ian). Hepatic Amoebiasis simulating Cholecystitis. Drainage of Abscess by Cholecystostomy: Recovery.—*Lancet.* 1929. July 27. pp. 171–172. [1 ref.]

MARSH (Frank). Bacillary Dysentery.—*Jl. Trop. Med. & Hyg.* 1929. Aug. 1. Vol. 32. No. 15. pp. 205–207.

DE MELLO (I. Froilano) & DA CRUZ (L. J. C.) Résultats du traitement expérimental de divers états d'amébiase intestinale par le Yatren purissimum. Mémoire présenté au Congrès International de Médecine Tropicale et d'Hygiène du Caire. 1928. 26 pp. [39 refs.] [School of Med., Nova Goa.]

NAKAMURA (H.) & SHAN (Chü Ping). On the Culture Media for the Isolation of Dysentery Bacteria.—*Jl. Oriental Med.* 1929. Oct. Vol. 11, No. 4. [In Japanese. English summary p. 132.]

VAN NITSEN (R.) & LANGERON (J.). A propos d'un cas de dysenterie amibienne. —*Bull. Méd. du Katanga.* 1929. Vol. 6. No. 1. pp. 41–43.

ORIISHI (Naotsugu). Paratyphoid Group Bacillus isolated from Stool of Dysentery like Disease of Infant.—*Jika Zasshi* (*Jl. Pediatrics*). 1929. May. No. 348. [Summarized in *Japan Med. World.* 1929. July 15. Vol. 9. No. 7. p. 231.]

PACHECO (Genesio). Observações sobre um surto de dysenteria bacillar nos quarteis da Villa Militar de Deodoro—Rio de Janeiro—durante o verao de 1926–1927.—*Sciencia Med.* 1929. June. Vol. 7. No. 6. pp. 261–266. [7 refs.] [German summary p. 266.]

PALEVICI-SADOGURSKAJA (Malca). Ricerche ed osservazioni sui batteri della dissenteria.—*Giorn. di Batteriol. e Immunol.* 1929. Sept. Vol. 4. No. 9. pp. 837–857. [3 refs.] [Inst. of Bact. & Immunol., Univ., Turin.]

PONS (R.). L'orientation actuelle des idées dans l'amibiase.—*Rev. Prat. Malad. des Pays Chauds.* 1929. July. Year 8. Vol. 9. No. 7. pp. 310–314, 317–320, 323–325.

SALVIOLI (Gaetano). Osservazioni epidemiologiche e terapeutiche su di un caso di amebiasi osservato a Padova.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Sept. Vol. 33. No. 9. pp. 472–474. [4 refs.] [Lab. of Trop. Path., Univ., Padua.]

SORGE (Giuseppe). Sulle epatiti amebiche.—*Policlinico.* Sez. Med. 1930. Vol. 37. 16 pp. [1 ref.] [Med. Clinic, Univ., Catania.]

WHITAKER (E. J.). Charcoal in the Treatment of Bacillary Dysentery.—*Seventeenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1928. pp. 143–144. [Tela Railroad Co. Hosp., Tela, Honduras.]

ERRATUM.

T.D.B., Vol. 26, No. 11, p. 896, WELCH summary, lines 4 & 5. Read "on second and third days 1 drachm (castor oil) hourly," *not* 1 oz.

HELMINTHIASIS.

FÜLLEBORN (F.). **Epidemiological Observations on Hookworm Infection. Discussion of the Question of Immunity and Specific Reactions of the Host in Helminthic Infection.**—*Brit. Med. Jl.* 1929. Apr. 27. pp. 755–759. With 6 text figs.

In North Corrientes, adjoining Paraguay, Stoll's caustic soda method showed a percentage of infection with hookworms of practically 100 and an average infection of 430 worms, 95 per cent. being *N. americanus* and 5 per cent. *A. duodenale*. Children under 10 were about twice as heavily infected as adults over 20. "The people of Corrientes in general give one the impression of being healthy, intelligent and lively," with a haemoglobin index on the old Sahli scale of 81·7 for males. Fülleborn has become "more and more convinced that in the past the damage caused by a slight hookworm infection in native populations has often been overestimated." In general, the haemoglobin content fell as the number of ova increased group by group, when the worms averaged more than 400 to 800. KIKUTH, collaborating with Fülleborn, found several times, but not always, a haemolysin in high concentration in the Ringer's solution in which living *A. caninum* had been kept for some days at body temperature. It was not destroyed by boiling. Precipitin and complement fixation tests and skin reaction to helminthic infections are discussed, and creeping eruption shortly considered.

Clayton Lane.

DIKMANS (G.). **The Viability of Hookworm Eggs and Larvae in Pit Latrines.**—*Amer. Jl. Trop. Med.* 1929. May. Vol. 9. No. 3. pp. 195–205. With 1 text fig. [6 refs.] [Experim. Station, U.S. Dept. Agric., Mayaguez, Porto Rico.]

Experiments were undertaken which confirm the observation that hookworm eggs submerged in liquid (in this instance urine or latrine liquid was used) do not develop, but that they will do so to infectivity if the eggs are removed and placed in suitable conditions. In these experiments viability persisted in submerged eggs for 11 days, the limit of the tests. When the infected faeces were not broken up (as they were in the experiments just cited) and were not always submerged, development might occur, and larvae were found in these conditions in latrine liquid up to 22 days, and eggs were viable up to 28 days, at which time the experiment ended.

A pit latrine was dug 4 feet square and 6 feet deep, with a trench behind, which allowed soil to be sampled at various depths and at various distances from the latrine. In this pit were placed daily urine and faecal material known to contain hookworm eggs. It took a surprisingly long time for "latrine conditions" to be established, namely, for the "bottom of the pit to become covered with black malodorous material to a depth of 1 or 2 inches." Whether further addition of faeces then took place does not seem to be stated, but no larvae were later found in the latrine material, in the surface soil round it or in the borings. Larvae were found in the well of the pit as high as 12 inches above the surface of the sludge. "As Payne has shown, infective hookworm larvae do not crawl up the side of a pit for any great distance," so that

if the latrine were nine feet deep as local regulations require, the 12 inches noted "would not constitute a great danger." "These findings apply only to the pit latrine with which the work has been done, i.e., a pit latrine dug in a heavy clay soil well above the ground water level." [Florence PAYNE actually showed that *within* a sandy loam soil larvae migrated upwards 36 inches, the limit set by the experiment, and that this occurred whether they were buried as larvae or as eggs. Within pure clay they did not migrate 6 inches. See this *Bulletin*, Vol. 20, p. 949.]

C. L.

MINAMIZAKI (Yushichi). **A Study on Hookworm Infestation in the Field.** —*Jl. Public Health Assoc. Japan.* 1929. July. Vol. 5. No. 7. pp. 1–3.

Minamizaki concludes that when a urine-faeces mixture containing hookworm eggs is sprinkled over soil, larvae develop in Saitama, Japan, except in winter and live 6 months. When the mixture is added to water, eggs live 9 weeks in summer and 5 to 6 in winter. He infected himself twice by walking bare foot on soil manured by night soil and positive by Baermann's apparatus to hookworm larvae. He experienced ground itch lasting for a number of days, and cough with plentiful expectoration, severe enough to prevent sleep on the second occasion, beginning on the 5th or 6th day and lasting 2 to 3 weeks. Eggs appeared on the 58th day after the first infection to the extent of some 50,000 daily, and on the 50th day after the second infection increased to 200,000 daily. Numbering was by Stoll caustic soda method.

C. L.

PESSOA (Samuel B.). Os levementes infestados nas campanhas sanitarias contra a ancylostomose. [**Light Infestations in Ankylostomiasis Campaigns.**]—*Bol. Inst. Hyg. de São Paulo.* 1929. No. 38. 8 pp. [12 refs.] [Hyg. Inst., S. Paulo.]

Pessoa records observations on 5 children. In the present state of our knowledge, he concludes, it has not been proved that lightly infested persons are without hygienic importance; the symptoms and blood formula in children often have no relationship to the number of worms carried; they should be treated to a microscopic cure.

C. L.

FISCHER (W. O.) & ORENSTEIN (A. J.). Die Hakenwurmkrankheit unter den Minenarbeitern am Witwatersrand. [**Hookworm Infestation among Miners on the Rand.**]—*Abhandl. a. d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26 (D., Med. & Vet. Vol. 2). [Festschrift NOCHT.] pp. 111–114. [Dept. of Sanitation, Rand Mines, Johannesburg.]

The authors examined by Willis's salt floatation method admissions into the City Deep Central Native Hospital and found hookworm eggs in 50 per cent. of "East Coast Boys" and 11 per cent. of "Union Boys." The floatation vessel was 7 cm. high and 4 cm. broad, and the Union Boys had already received carbon tetrachloride. The total number reported upon is uncertain but was not less than 1,530. About half the East Coast Boys had been in the mine not longer than 2 months, and

it is concluded that they must have been infected on arrival. Of 57 whites examined because suspected of infection this method of diagnosis gave an infection rate of 75·4 per cent., but in natives symptoms were usually slight. The soil of thirteen mines was examined and was found infected in all, and on one occasion larvae were recovered from the boots of the doctor and his sanitary gang immediately after a round of duty, an illustration of one method by which infection may be spread. In two mines mules were used, all animals, even dogs, being excluded elsewhere. Strongyloides larvae were found at the rate of 2 per mille in fresh stools. The infected parts of mines had a temperature between 19° C. and 27° C. (66°–80° F.); the reaction of their water varied from alkaline to an acidity corresponding to 0·075 per cent. of sulphuric acid. It is advised that new-coming East Coast Boys should be twice treated, with 3 to 4 cc. of carbon tetrachloride; [the present dosage which seemingly leaves 11 per cent. infected to a diagnosis by Willis's method is unstated]. The existing variety in latrines and transport of faeces to the surface should be made uniform according to some model method. Disinfection was being investigated.

C. L.

AUGUSTINE (D. L.), HELMY (M.) & NAZMI (M.). **Ancylostomiasis and Ascariasis in Egypt.**—*Amer. Jl. Hyg.* 1930. Jan. Vol. 11. No. 1. pp. 136–148. With 13 text figs. [3 refs.] [Med. School & School of Public Health, Harvard Univ., Boston.]

From 12 villages about 900 satisfactory faecal specimens were obtained. They were examined for infection by Willis's floatation method and counted by Stoll's [apparently by Stoll-Hausheer]. In Upper Egypt the intensity [here the meaning is the percentage of population infected] of ancylostome infection is high, in Lower Egypt low. The reverse holds of ascaris infection. For the sexes the intensity [here the meaning is average number of worms per head] of infection is higher in men for ancylostomes and for women for ascaris. Regarding prevention, it is pointed out of the fellaheen that "not until some constructed latrine equally good or better than that provided him by nature is placed at his disposal will he be willing to forsake the former." The average number of hookworms, all *A. duodenale*, recovered from 37 worm counts was 51. Only four persons harboured over 100 hookworms. "Two of these cases yielded 168 worms respectively," the third exactly 200, and the fourth exactly 400, so the paper states.

C. L.

MIRRA (Guido). L'anchilostomiasi nella Somalia Italiana meridionale. Note su 4000 casi accertati lungo il medio Uebi-Scebeli. [**Ankylostomiasis in Southern Italian Somaliland. Notes on 4000 Cases met with along the Webi Shebeli.**]—*Ann. di Med. Nav. e Colon.* 1929. Sept.–Oct. Year 35. Vol. 2. No. 3/4. pp. 181–192. With 1 plate. [6 refs.]

Hookworm infestation in some parts of Italian Somaliland is very prevalent. In one group of 600 individuals examined, 72 per cent. had ova of *A. duodenale* in the faeces, 28 per cent. *N. americanus*, 64·5 per cent. *Ascaris lumbricoides* and 22·3 per cent. *Trichuris trichiura*. Flagellates, *Chilomastix mesnili* and Trichomonas, were also found in 8 and 5 per cent. respectively. He compares the results of oil of

chenopodium, thymol, betanaphthol, and carbon tetrachloride in treatment and finds the last to give the best results in doses of 3 cc. for adults.

H. Harold Scott.

MAPLESTONE (P. A.). **The Species Distribution of Hookworms in India.**—*Indian Med. Gaz.* 1929. July. Vol. 64. No. 7. pp. 371–373. [6 refs.] [School of Trop. Med., Calcutta.]

In-patients of the Carmichael Hospital, Calcutta, were examined for hookworm infection, evidently as a routine measure, since it is stated that few were admitted for hookworm treatment. There were found infected 646; what percentage this comprises is not clear. Hookworm eggs were still present in 231 cases after one or more treatments, the drug used not being indicated, while 91 were discharged for other reasons before it could be ascertained with certainty whether they had ceased to pass eggs. Lane's direct centrifugal floatation was used for determining this point in the second half of the series and showed a cure percentage of 47, as compared with one of 68 in the first half, obtained by an unstated technique, "there being no other change in treatment or diagnosis whatever." The number of worms recovered was 18,634, comprising 13,483 *N. americanus* (6,285 males and 7,198 females) and 5,151 *A. duodenale* (2,213 males and 2,918 females). *A. braziliense* was absent. Reference is made to reported species distribution in various parts of India [to which may be added that in the abstracter's experience *A. duodenale* was entirely absent in the Darjeeling hills, where hookworm disease due to necator was severe, but was present as well as necator in the plains at their feet].

C. L.

JACOCKS (W. P.). **Report of the Director, Anchylostomiasis Campaign, Ceylon, for the Year 1927.**—*Ceylon Administration Rep. Director of Med. & San. Services 1927.* Appendix pp. C 50–C 61. With 2 maps & 8 figs. on 4 plates.

In this extensive campaign all stool examinations were made at a central laboratory. Precautions taken to prevent hatching of larvae between collection and examination are unnoted. These examinations, made during 1927 by Stoll's caustic soda dilution method, numbered 23,055, while those treated numbered 1,348,102. If specimens sent to the central laboratory were negative to Stoll's method they were examined by "the salt flotation method" [of which there are several having very varying degrees of accuracy]. For treatment oil of chenopodium was given to children between 2 and 10 years of age; above that age this drug was combined with carbon tetrachloride. The proportion was 2 to 1 up to 18 and 3 to 1 over that age, the maximum dose of the mixture being 45 minims. This treatment left behind between a quarter and a third of the worms as judged by the Stoll counts made before and 15 days after treatment, and reduced the recognized percentage of infected persons from 87·7 to 53·7 [the first figure, it may confidently be concluded, being less incorrect than the second (see MAPLESTONE and MUKERJI below p. 419)].

C. L.

LALLEMANT (M. Avé). Die Hakenwurmbekämpfung in West-Flores (1923–1927). [**Anti-Hookworm Measures in West Flores, D.E.I.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Apr. Vol. 32. No. 4. pp. 175–178. With 2 text figs.

This inhabitants of this island in the Dutch East Indies are mainly of Malayan blood with a small admixture of Papuan. All are infected with hookworms and nearly all with ascaris. The mean haemoglobin index of 12 villages at a height of 1,200 m. (4,000 ft.) is 58 to 67, the altitude being held to exclude malaria as a cause. The people live in circular or oblong houses raised on piles 1 m. from the ground, each containing compartments for 5 to 40 families, and defaecation at night takes place through holes in the floor. This soiled ground beneath the houses is the favourite playground for children when it rains, and the men keep gear there and go in to attend to it. From 200 cc. of the soil under the houses 5,000 nematode larvae have been recovered, from that of the coffee gardens a maximum of 38. Among the inhabitants there is a slight preponderance of necator over ancylostomes, 561 to 439 per 1,000 worms. Of the children two-fifths die from intercurrent illness attacking those weakened by hookworm infection. The villages are being rebuilt as small houses raised 1·75 m., so that sun and wind can dry up the ground under them, a condition which Lallemant finds to destroy larvae in the local earth. Treatment has been given to 237,000 persons, at first 3 cc. of carbon tetrachloride and 18 drops of oil of chenopodium. On account of vomiting, headache, and fatalities the doses are now 2½ cc. and 15 drops respectively. There were six deaths in all, whether all with the use of the higher dosage is unstated.

C. L.

PIROT. Nécatorose chez les matelots indigènes du recrutement Indochinois, embarqués sur un bâtiment des forces navales en Extrême-Orient. [**Necator Infection in Sailors, Natives of Indo-China, on Board Ship.**]—*Arch. Méd. et Pharm. Nav.* 1929. Apr.–May–June. Vol. 119. No. 2. pp. 284–292. [7 refs.]

Adult worms were not seen; the diagnosis rests on the statement that *A. duodenale* has never been found in Indochina. By smears and Telemann's method eggs were found in 27 of 37 sailors examined at the beginning of the cruise, and in 10 per cent. fewer after 18 months' duty. Three culture experiments were found very puzzling, larvae disappearing. The cultures were set in a dish containing caustic potash ["lessive de potasse"] of unstated strength [which perhaps dissolved all migrating larvae].

C. L.

SCHAPIRO (Louis). Infestación de Ancylostoma en Costa Rica después de 15 años de combatirla. [**Hookworm Infestation in Costa Rica after Fifteen Years' Campaign.**]—Reprinted from *An. Facul. de Med. de Costa Rica.* 1929. Oct. pp. 75–111. With 5 graphs. [7 refs.]

As regards the actual percentage of infection the improvement would not seem to be very great after so long a campaign. The figures are

given for the periods 1914–20 and 1921–27. During the first, 267,573 persons were examined and 52·8 per cent. were found infested; in the second, 228,941 were examined, 54·1 per cent. infested. The sexes were attacked in the proportion of 55 males to 45·7 females [but the number recorded as examined is nearly 20,000 greater than the total given previously for the same period]. 57 per cent. of those between 6 and 18 years of age, and 59·3 between 19 and 40 years were infested. As for race, of 176,919 whites 75,170 (42·4 per cent.) were affected; of 93,933 half-castes 68·3 per cent.; of 1,536 blacks only 231 (or 15 per cent.); but of 909 native Indians 841 (or 92·0 per cent.) were found.

In the towns the infection was but mild, as would be expected, whereas in the rural districts fully half the population had hookworms to a serious degree, and one-third of these were very heavily invaded. The degree, however, is less than in the early days of the campaign, for in 1911, as shown by hospital statistics, 26·2 per cent. were admitted for ankylostomiasis as compared with 9·5 per cent. during the five years 1922–26.

The most recent records show that 78·5 per cent. have but a mild infestation and only 2·9 are seriously infested; the average reduction of haemoglobin is to the region of 60 per cent., or a little over. Faecal examination was by three smears of 2 by 1 inches.

H. Harold Scott.

NAUCK (Ernst G.). Zur Hakenwurmverbreitung in Costa Rica. [**Distribution of Hookworm in Costa Rica.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Sept. Vol. 32. No. 9. pp. 482–484. With 1 map in text. [1 ref.] [San Juan de Dios Hosp., San José, Costa Rica.]

In the first hundred post-mortem examinations made in Costa Rica by Nauck there was a pure infection with *N. americanus* in 24, a pure infection with *A. duodenale* in 5 and a mixed infection of the two in 9. All the cases of infection with *A. duodenale* came from the Pacific zone of the isthmus.

C. L.

HILL (Rolla B.). La anquilostomiasis en Venezuela. [**Ankylostomiasis in Venezuela.**]—*Gac. Med. de Caracas.* 1929. Jan. 31. Vol. 36. No. 2. pp. 17–19. [Public Health Lab., & Rockefeller Foundation, Maracay, Venezuela.]

Diagnostic examination was by the Willis technique, while about 10 per cent. were counted by the Caldwell technique. Of the 10,653 persons examined this diagnostic method showed 70 per cent. infected with hookworms and 91 per cent. with intestinal parasites of some kind. Regional hookworm infection varied from 20 to 92 per cent., and in the latter case some 40 per cent. were gravely infected. Of 5,000 worms collected all were necators. Less than 10 per cent. of houses in the interior have latrines.

C. L.

HERNANDEZ PACHECO (Diego). El problema de la anquilostomiasis en las minas de España. [**Ankylostomiasis in Spanish Mines.**]—*Medicina Países Cálidos.* Madrid. 1928. Jan. Vol. 1. No. 1. pp. 39–53. With 11 text figs. (1 map).

Examinations, apparently of a routine nature, were made on many miners between 1925 and 1927. The mode of examination seems nowhere stated. The percentage of infection found varied from 89 to 0 in different mines. Districts with coal mines showed the highest percentages, namely, 35, 43, 58 and 61 ; those with lead mines came next, namely, 14 and 30; while those with copper-iron mines were without infection. Treatment was with 1·4 to 1·8 cc. of oil of chenopodium in the early morning followed by 60 cc. of a saturated solution of sulphate of magnesia. The whole was repeated in ten days. By the unstated diagnostic method used this gave 82·14 per cent. of cures. The effects seem to have been irregular. For example, the percentage of infected in Santa Rosa and Antolin mines was unchanged between 1925 and 1927, whereas in S. Rafael it rose from 78 to 86 in 600 to 800 examinations in each year, while in the mines of Linares there was a general fall.

C. L.

GUILLAMON (Antonio). La anquilostomiasis en la huerta de Murcia. [**Ankylostomiasis in Murcia.**]—*Medicina Países Cálidos.* Madrid. 1928. Jan. Vol. 1. No. 1. pp. 54–63. With 6 figs. on 2 plates & 1 text fig. [5 refs.]

This report deals with a population which, whether adult or not, worked bare foot in vegetable gardens. Willis's floatation technique was used for diagnosis and 1,322 persons were examined. The infection rate, as reported by various organizations, lay between 8·49 and 34·09 per cent. ; the author's was 12·22 in 90 examinations of 44 boys and 46 girls, that for school boys being 18·18 and for school girls 6·52. Treatment was by oil of chenopodium, 1·2 cc. to 1·5 cc. for an adult. A great point was made of propaganda in schools. [Infection in about 700 miners of Murcia in 1925 was 1 per cent.]

C. L.

RICO (J. Toscano). **Indigenous Hookworm Disease in Portugal.**—*Arquivos Inst. Bact. Camara Pestana.* 1928. Vol. 6. No. 1. pp. 89–120. With 1 map. [22 refs.]

The 5 coal mines investigated vary. One was an open quarry and had no infection. Another had galleries of slight depth which had been worked for a few months only by persons dwelling in the neighbourhood and had an infection rate of 10·5 per cent. A third had galleries opening on the hillside worked by regular miners, as well as by the men of the neighbourhood as a secondary occupation, the latter working shod, and defaecation in the mine being forbidden ; the infection rate was 13·8 per cent. The other two were typical shafted and galleried mines in which men eased themselves as they worked, and had infection rates of 47·4 and 98 per cent. Diagnosis was by what is called Willis's method, but is really a modification of the Hamburg cover-glass method which merely samples the surface and does not take up the whole of it as does Willis's. In all, 323 persons

were examined microscopically. Treatment of a "small number of men" was by oil of chenopodium, 3 cc.; stools of the following 24 hours were examined for parasites; but no general ratio between ancylostomes and necators could be offered, though in S. Pedro do Cora mine, with 47·4 per cent. of ascertained infection, ancylostomes predominated. "Against the numerous advantages which it [D.C.F.] offers the fact that it requires special apparatus and experienced investigators to work it justified (not to mention the long time it takes) the wide use by American authors of the simplest of all, the Willis method." [One suitable D.C.F. centrifuge with its normal team of cheap labour would have completed in one day the amount of diagnostic work here reported; and Willis technique was not that in use.]

C. L.

GARIN (Ch.), DOUBROW & MOUNIER. Deux ans de lutte contre l'ankylostomose des mineurs dans le bassin de St. Etienne (Houillères de Montrambert). [**Two Years Anti-Hookworm Measures in Coal Miners of St. Etienne.**]—*Méd. du Travail.* Lyons. 1930. Jan. Vol. 1. No. 2. pp. 41–50. [6 refs.]

The method of diagnosis was Garin's modification of Telemann's technique (this *Bulletin*, Vol. 25, p. 936) which takes 5 minutes for each examination. It displayed these percentages of infection: Loire mines, 49; St. Etienne pits, 42; la Molière and Firminy rock, 27; La Chazotte, 50; Forez, 50. Of the 1,200 parasitized, 1,032 were classed as carriers, 31 as sick and 173 as ailing. The division between carriers and others came where, by the above technique, there were much less than, or more than, 200 eggs in a faecal preparation 22 mm. square. The really sick had as many as 3,000 eggs in this quantity. Carriers had 70 per cent. or more haemoglobin to the Sahli-Gowers instrument. Treatment was by 3 gm. of powdered thymol on each of 3 consecutive days.

C. L.

BRUNI (R. M. Enrico). L'anchilostomiasi nell'Abruzzo Citeriore. (400 casi). [**Ankylostomiasis in Abruzzo Citeriore.**]—*Ann. di Med. Nav. e Colon.* 1929. July–Aug. Year 35. Vol. 2. No. 1–2. pp. 26–43. With 2 plates. [2 pages of refs.]

This district lies on the Italian Adriatic coast. The cases of ankylostomiasis recovered numbered 400. Diagnosis was by Kofoid and Barber's gravity floatation, which also disclosed ascaris 116, trichuris 68, enterobius 28, and *H. nana* 5 infections. Treatment and prophylaxis are considered.

C. L.

BLAJIN (A. N.). Die neuen Quellen der Nekatrose im Uferland des Schwarzen Meeres. [**New Findings of Necator on the Black Sea Shore.**] Referat, gehalten in der Kommission für das Studium der Helminthenfaune von SSSR, am Zoologischen Museum der Unionakademie der Wissenschaft. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Jan. Vol. 32. No. 1. p. 50.]

Blajin has investigated the percentage of parasitism by hookworms in Abkhasia on the shores of the Black Sea. Stools were examined in over 700 cases, the method being unstated in the author's summary.

The percentage of children found infected in one school was 88·6, in another 42·5. The average seems to have been about 57. After thymol, given in doses of 4 to 6 gm. to children, 58 per cent. of cases passed necators, one having as many as 1,572 worms and haemoglobin of 25 per cent. As usual the infection is essentially one of villagers.

C. L.

MTSCHEDLIDSE (I.). Materialien zur Erlernung der Ankylostomidose in Adjaristan. [**Notes on Ankylostomiasis in Adjaristan.**]—*Nachrichten d. Tropischen Medizin.* Tiflis. 1929. Mar. Vol. 2. No. 3. [In Georgian script. German summary p. 261.]

In 6 schools about Batum 630 children were examined, the method being by smear and Fülleborn's floatation. The average hookworm infection was 52·8 per cent., but in one spot it was 100. Other figures are ascaris 63·6, trichuris 77·8, *Hymenolepis nana* 2·5, *Enterobius vermicularis* 94. In hookworm cases haemoglobin lay between 45 and 28 in four, eosinophilia average 16, and necator comprised 91 per cent. of the worms recovered from them.

C. L.

MUDSCHIRI (M.). Ueber die Verbreitung der Ankylostomidose und anderer Darmwürmer im Adjaristan. [**Distribution of Ankylostomiasis and Other Intestinal Worms in Adjaristan.**]—*Nachrichten d. Tropischen Medizin.* Tiflis. 1929. Feb. Vol. 2. No. 2. [In Georgian script, German summary p. 180.]

Examination of smears showed 100 per cent. of children from nine schools infected with the common intestinal nematodes. In Batum, there was in addition a hookworm infection of 62·7 per cent. this infection too being widespread. It is noted that the real percentage of infection must be much higher.

C. L.

DUBROWINSKI (S. B.), KRANZFELD (A. M.), ROSENFELD (W. D.) & SALAMANDRA (E. G.). Zur Hakenwurmverbreitung in Turkmenistan. [**Distribution of Hookworm in Turkmenistan.**]—*Cent. f. Bakt.* I. Abt. Orig. 1928. July 25. Vol. 108. No. 1/4. pp. 172–177. When 1 text fig. [State Inst. for Sanitation & Hyg., Moscow.]

The diagnostic method used was the Kofoid-Barber-Fülleborn one, which seems to mean Fülleborn's floatation technique. It was compared with a smear made from the precipitate in a faecal suspension. The latter showed 21 per cent. of the population carrying ascaris infection mostly by unfertile eggs; while the former was negative, but Telemann's method seems to have given 2 more positives for hookworm eggs in 24 examinations than did Fülleborn's. In two boys who were treated, the hookworms recovered were *A. duodenale*. The rectal probe gave eggs of *E. vermicularis*. [A 21 per cent. infection mostly by unfertile and presumably solitary ascaris females is most unexpected.]

C. L.

i. VOSKRESSENSKI (B.). La faune helminthique chez les populations rurales en Azerbaidjan. [**Worm Findings in Azerbaijan.**]—*Arch. Inst. Microbiol. et Hyg. d'Azerbaidjan.* 1929. Vol. 1. No. 1–2. pp. 3–10. With 1 map in text. [In Russian. French summary pp. 145–147.

ii. ZDRODOWSKI (P.) & VOSKRESSENSKI (B.). Ankylostomose et son épidémiologie dans le district de Lenkoran en Azerbaidjan.—*Ibid.* pp. 11–44. With 2 maps in text. [In Russian. French summary pp. 147–150. With 1 map in text.]

iii. YAGOUBOFF (F.). Sur le caractéristique de la faune helmintique et spécialement de l'ankylostomose dans le district de Zakataly en Azerbaidjan.—*Ibid.* pp. 45–52. [2 refs.] [In Russian. French summary p. 150.]

iv. VOSKRESSENSKI (B.). Les observations cliniques et celles du laboratoire sur l'ankylostomose.—*Ibid.* pp. 53–78. [In Russian. French summary pp. 151–153.]

It is difficult to determine to what extent the numerous reports appearing from Azerbaijan are merely restatements.

i. This deals with 15,010 persons examined in 1927–28 in rural districts. Infected were 88·3, with trichuris 75·8, with ascaris 38, with hookworms 27·4, all percentages, together with many more infections. The methods were Fülleborn's and Telemann's.

ii. Presumably by the same diagnostic methods, 5,720 examinations in Lenkoran exhibited hookworm infection in 747. They were treated with thymol and carbon tetrachloride and an average of 210 worms per head recovered. Most infections lay between 101 and 500 by this test, but no indication of dosage or of determination of disinfestation has been traced in the abstract, so that it is unnecessary to consider here the relationship described between worms and anaemia.

iii. In Zakataly 900 mussulman peasants examined by Fülleborn's technique were all infected with some intestinal parasite. Hookworms parasitized 30 to 72 per cent. of them; ascaris 78·7 per cent.

iv. The last note refers to Lenkoran. Stoll's figure of 44 eggs per gram per female hookworm did not apply. The figure was about 100, the infection being 30 per cent. by ancylostomes and 70 per cent. by necators. Thymol gm. 4 and carbon tetrachloride 1·5 cc. were the treatments given. Their results are not distinguished, but worms were recovered on consecutive days in these percentages: first, 78·6; second, 18·7; third, 2; fourth, 0·05 [sic], fifth, 0·2.

C. L.

KOBAYASHI (Toshizo). Sur les phénomènes régénératifs des hématies dans les anémies de l'ankylostomiase. [**Regenerative Phenomena of Blood Cells in the Anaemia of Ankylostomiasis.**]—*Le Sang.* 1929. Vol. 3. No. 2. pp. 129–148. With 3 figs. [59 refs.]

"Seven cases of anaemia due to ankylostomiasis" form the basis of this study. The blood conditions after a vermifuge were as follows. Absorption of oxygen by red corpuscles remained high. Reticular erythrocytes remained normal or might be slightly increased in numbers. Resistance to haemolysis remained high. Bile in blood and urine remained normal. Anaemia was not improved. After administration of iron there was rapid blood regeneration and disappearance of the anaemia.

C. L.

TSUNASHIMA (Yoshito). **On the Blood-Picture (especially Blood-Platelets and Reticulated Red Cells) and Blood Sedimentation of an Ankylostomiasic Patient.**—*Arb. a. d. Med. Univ. zu Okayama.* 1929. June. Vol. 1. No. 2. pp. 158–165. [25 refs.] [Med. Clinic, Univ., Okayama.]

In ten healthy men the number of blood platelets varied between 260,000 and 300,000, presumably per cmm. Of 24 ankylostomiasis cases there were less than 300,000 in three of them [two of these, however, were tested only after disinfestation], between 300,000 and 400,000 in 14, and between 400,000 and 500,000 in 7; for the summary should not be followed here. Eosinophils lays between 2·3 and 35·0 per cent. Blood sedimentation was more rapid as anaemia was greater.

C. L.

SAKARAJA (E.). E[i]nige Worte anlässlich der chirurgischen Bedeutung der Ankylostomidose. [**Significance to the Surgeon of Ankylostomiasis.**]—*Nachrichten d. Tropischen Medizin.* Tiflis. 1929. Feb. Vol. 2. No. 2. [In Georgian script. German summary p. 181.]

The presence of ankylostomiasis has confused the writer's surgery; An apparently tuberculous peritonitis has cleared up after thymol. a superficial sore with recurring bleeding, and a pleuritic effusion, failed to heal without a course of thymol. A radical cure of inguinal hernia under local anaesthesia was followed by collapse, and a brilliant recovery after anthelmintic treatment.

C. L.

ALLAN (Wm.). **Hookworm Disease causing the Blood Picture of Primary Hemolytic Anemia in an Infant.**—*Ann. Intern. Med.* 1928. Feb. Vol. 1. No. 8. pp. 605–606. [4 refs.]

A twelve-months' old baby is concerned, with haemoglobin 47, red corpuscles 2,470,000, colour index about 1, leucocytes 12,000, polynuclears 56, small mononuclears 41, large mononuclears 2, neutrophilic myelocytes 1, eosinophils 0. Red corpuscles showed moderate variation in size and shape with some polychromasia; there were 360 normoblasts and 120 megaloblasts per cmm. Faeces were strongly positive for occult blood, the child being still almost exclusively breast fed, and "crowded with hookworm eggs." After treatments (one at least with 1 grain of thymol) covering 4 months, "all hookworms were expelled, and the child has been normal ever since."

C. L.

SMITHIES (Frank). **Parasitosis of the Bile Passages and Gall Bladder. A Report upon 37 Instances of Protozoiasis and One Instance of Infestation by** *Necator americanus.*—*Amer. Jl. Med. Sci.* 1928. Aug. Vol. 176. No. 2. pp. 225–253. [32 refs.]

"From a patient, at the fourth attempt to 'drain' his biliary tract [by duodenal sound] and after a seven-hour session with frequent intraduodenal stimulation with warm $MgSO_4$ solution, my associate, Dr. R. B. OLESON, recovered quite suddenly, approximately 2 drams of foul-odoured, greenish-grey, grumous pus. This came from the tube under pressure. Microscopic examination was made immediately. In one field were seven viable hookworms (*Necator americanus*) and in others several ova."

[That a microscope should be needed to determine the presence of adult *N. americanus* is astonishing and that seven specimens could possibly be seen in one microscopic field is impossible. Necator eggs do not hatch in the intestine. Possibly eggs and larvae of *Strongyloides stercoralis* were seen.]

C. L.

VON BÜLOW (T.). Tuberculose latente réactivée par le passage des larves d'ankylostomes à travers le parenchyme pulmonaire. [**Latent Tuberculosis reactivated by Passage of Ankylostome Larvae through Lung Parenchyma.**]—*Bull. Soc. Path. Exot.* 1929. Jan. 9. Vol. 22. No. 1. pp. 26–30.

Larvae unhesitatingly identified as those of "*Ancylostoma duodenale*" were found in sputum containing also acid-fast bacilli, while the stools contained hookworm eggs. The man was treated with oil of chenopodium, and 200 ampules of a preparation containing "phenol, iodine, arsenic, etc.," were injected. He recovered.

C. L.

LAMSON (P. D.), ROBBINS (B. H.) & WARD (C. B.). **The Pharmacology and Toxicology of Tetrachlorethylene.**—*Amer. Jl. Hyg.* 1929. Mar. Vol. 9. No. 2. pp. 430–444. [36 refs.] [School of Med., Vanderbilt Univ., Nashville.]

Tetrachlorethylene in stoppered amber bottles does not produce phosgene. It is insoluble and has a chlorine content of 85·5 per cent. Its absorption from the stomach of dogs is ordinarily inappreciable up to about 10 cc. per kilo, the animals appearing quite normal; but if fat be given signs of hypnosis are seen in all dogs at a dosage of 4 cc. per kilo or more. Cats and puppies show absorption to some extent, and mice and rabbits absorb rapidly. Absorption is tested thus. In a tracheotomized dog carbon tetrachloride appears in the breath within 15 minutes after its injection with a fine syringe into an exposed loop of intestine; tetrachlorethylene does not. If the quantity of carbon tetrachloride be increased, its excretion in the breath is not increased; but if the liver be cut out by an Eck fistula with tying of the portal vein, each addition to the amount of this drug injected into the gut is followed by a corresponding rise in its excretion. With tetrachlorethylene no such result follows; in doses up to 10 cc. per kilo injected into the intestine none of the drug was found in the breath by a method which can detect 1 part in 40,000.

Correlated with this, Lamson and his colleagues have found no definite pathological changes in the liver or kidneys. They corroborate the finding that there is no liver necrosis even after five to six hours of complete surgical anaesthesia or after several months of a dosage of 2 cc. per kilo given every two or three days. In dogs the livers show no change whatever. In puppies and cats there is a varying fatty metamorphosis, but they question whether the variation is more than normal; and the phenolphthalein retention test showed no significant loss of liver function. All kidney tests were negative, apparently in dogs; and there was no marked decrease in levulose tolerance. Neither cats nor dogs showed any appreciable increase

in the icteric index, nor significant changes in blood sugar or blood guanidine. "Tetrachlorethylene differs fundamentally from chloroform and carbon tetrachloride in causing no appreciable pathological and functional changes." But, on the other hand, "If the same intravenous dose which gave a marked fall in blood pressure when injected into the femoral vein is injected into the portal vein, no fall of blood pressure occurs, showing that the liver is able to take up this substance as it does carbon tetrachloride." The criticism seems justified in spite of the negative results of recognized liver-function tests that, if in certain unknown respects the organ is not functioning properly, there would, after all, be risk in the administration of tetrachlorethylene.

C. L.

MAPLESTONE (P. A.) & MUKERJI (A. K.). **Tetrachlorethylene in the Treatment of Hookworm Disease.**—*Indian Med. Gaz.* 1929. Aug. Vol. 64. No. 8. pp. 424–426. [5 refs.] [Calcutta School of Trop. Med., Calcutta.]

These authors consider the reports by others on the use of tetrachlorethylene against hookworms. They contrast their own result in 82 cases treated with 3 cc. of the drug, with those of 135 cases treated by them with carbon tetrachloride. In both series oil of chenopodium might or might not be added. The number of eggs was estimated by Stoll's caustic soda method before and after treatment. It showed a total of 1,308 eggs actually counted by the technique before treatment with tetrachlorethylene and of 517 after treatment, a difference which presumably implies a persistence of about 40 per cent. of the worms. The presence or absence of cure was tested by D.C.F., which showed that 79·3 per cent. of their patients remained infected after tetrachlorethylene and 52·6 per cent. after carbon tetrachloride. Speaking of the testing of the drug by others they write: "In none of the other instances which have been quoted [in the first part of the paper] for comparison has this method [D.C.F.] been employed. The great superiority of Lane's method over any other for demonstrating light infections is quite sufficient to explain the low percentage of cures in the writers' cases. It was the discovery of the ridiculously low rate of complete cure that even the most powerful vermifuges bring about when checked by the direct centrifugal flotation method that led the writers to make use of the percentage reduction in eggs as a test of drug efficiency." They instance a group of 12 cases in which Stoll's method showed 4 only infected, whereas D.C.F. showed that 11 actually were so. As regards toxic effects, these were checked in hospital cases as follows.

	Total.	Giddiness.	Vomiting.	Drowsiness.
Tetrachlorethylene, 3 cc. ...	38	6	1	1
Tetrachlorethylene and oil of chenopodium, 1 cc. ...	37	19	4	3

The addition of oil of chenopodium added then considerably to the toxic effects which were already evident when tetrachlorethylene was given alone.

C. L.

KENDRICK (J. F.). **The Treatment of Hookworm Disease with Tetrachlorethylene.**—*Amer. Jl. Trop. Med.* 1929. Nov. Vol. 9. No. 6. pp. 483–488. [3 refs.]

In the Madras Presidency the necator-ancylostoma rate is about 19 to 1. The report deals with 119 prisoners in the Madras Penitentiary. Tetrachlorethylene, alone or with oil of chenopodium, was given fasting in 2 oz. of concentrated magnesium sulphate solution with 2 oz. of the same aperient on the next two mornings at 7. The men were locked up for those 3 days, and all stools were collected and washed. The efficacy of this treatment was tested by Schüffner's method of further treatment and of determining the percentage of the whole worm recovery which the first treatment disclosed. Schüffner's method was modified in two interesting particulars. D.C.F. was used to determine disinfestation, and treatments were repeated " until no ova were demonstrable by repeated examinations by the Clayton Lane D.C.F. method." Judged by this standard tetrachlorethylene 2 cc. removed 88·9 per cent. of necators (88 per cent. of males and 89·7 per cent of females) and 87·3 per cent. of ancylostomes (97·3 per cent. males and 79·5 per cent. females) ; for 3 cc. the figures were 89·8 (88 and 91·8) necators and 82·7 (86 and 80) ancylostomes ; for 1·8 cc. of tetrachlorethylene and 0·6 cc. of oil of chenopodium 94 (92·1 and 96·2) necators and 48 (57·8 and 37·5 ancylostomes. The numbers treated in the three categories were 59, 30 and 30 and the total number of worms recovered 5,829. No fatalities and only one intoxication were observed in the series of approximately 1,500 treatments with 3 cc. of tetrachlorethylene.

C. L.

HALL (Maurice C.) & AUGUSTINE (Donald L.). **Some Investigations of Anthelmintics by an Egg and Worm Count Method.**—*Amer. Jl. Hyg.* 1929. May. Vol. 9. No. 3. pp. 584–628. [22 refs.] [Bureau of Animal Industry, U.S. Dept. of Agric., Washington, D.C. & Med. School & School of Public Health, Harvard.]

Investigations planned by these members of an expedition, sent to Nicaragua by the School of Hygiene and Public Health, Johns Hopkins University, with the support of the International Health Board of the Rockefeller Foundation, were much marred by a revolution. The method of egg diagnosis was by the small-drop caustic soda solution of Stoll and Hausheer [which counts 1/200 gm. of faeces], while worms were recovered by sieving all stools passed within 72 hours of treatment through 4 wire screens, the smallest having 100 apertures to the linear inch. A second ovum count was made 10 days after treatment with tetrachlorethylene and not less than 12 days after chenopodium.

In 10 soldiers treated with 3 cc. of tetrachlorethylene egg counts showed an average reduction of eggs of 87·65 per cent. ; yet a table shows that 80 per cent. of them remained infected. Similarly tetrachlorethylene 3 parts and ascaridole 1 part were given to children in general dosage of 0·05 cc. for each year of age or 0·6 cc. for a child of 12. Of 21 cases completely examined by this method 3 showed more eggs after than before treatment, 2 showed the same numbers although one had passed 6 female necators, in 10 there were fewer eggs after treatment, and in 6 there were none on the second count. However, 3 of these last 6 showed eggs on a third examination even though this had been preceded by a second treatment. The number of children left infected by a single

treatment was therefore 18 of 21 or 85·7 per cent. The authors, however, prefer to stress the fact that a 74 per cent. reduction occurred in the number of hookworm eggs.

A significant observation is made in the treatment by carbon tetrachloride. In one case 90 eggs were counted per slide and 319 female necators recovered; in another with 44·5 eggs per slide only 3 female ancylostoma indicating "that the drug either displayed very dissimilar efficacies against the hookworms in these cases or else the correlation between the number of hookworms present and the slide egg counts is very slight" [see, however, Sarles's paper on p. 423].

Santonin did not give good results against ascaris. The dosage was 2 or 3 grains in the morning sometimes preceded by 2 grs. at night. Leche de higueron removes whipworms rather dependably but usually fails to remove all of them. Oil of chenopodium was shown by counts to be very effective against ascaris, little effective against whipworms, threadworms and tapeworms. Mercurochrome gave questionable results. Kamala failed in removing tapeworms from at least 2 of 3 children treated.

C. L.

CORT (W. W.), SCHAPIRO (Louis) & STOLL (N. R.). **A Study of Reinfection after Treatment with Hookworm and Ascaris in Two Villages in Panama.**—*Amer. Jl. Hyg.* 1929. Nov. Vol. 10. No. 3. pp. 614–625. [9 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

The village Sardina was "sanitated," that is had latrines, largely used; the village Marica Arriba had none, with much soil pollution. About 100 persons from each village were examined four times: first before treatment, and then at intervals of about 1, 2 and 7 months from the date of treatment. The second examination was never made less than two weeks from treatment. Each examination was by counting a two hundredth of a cc. of faeces by Stoll's caustic soda method; treatment was by "tetrachlorethylene, or a combination of this drug and oil of chenopodium for adults and oil of chenopodium alone for children," and only one treatment was given. The average counts of eggs in hundreds per cc. of faeces are seen in the Table, where the "total" applies to all persons examined, "sanitated families" to persons living in latrined houses with no evidence of soil pollution, while those "unsanitated" had evidence of soil pollution and so were not using their latrines. A number of families were evidently not classed under either subhead.

	Sardina.				Marica Arriba.			
	1st Count.	2nd Count.	3rd Count.	4th Count.	1st Count.	2nd Count.	3rd Count.	4th Count.
Hookworms, Totals...	196	60	80	103	130	64	75	101
In "Sanitated" families ...	222	43	49	54	—	—	—	—
In "Unsanitated" families ...	218	75	98	104	—	—	—	—
Ascaris, Totals ...	232	72	158	485	161	115	94	131
In "Sanitated" families ...	59	17	16	79	—	—	—	—
In "Unsanitated" families ...	154	85	57	341	—	—	—	—

[These counts confirm, for those who are satisfied with this counting method as a measure of diagnosis, the well-known fact that an adequate latrine protects from hookworm reinfection.] A great rise in ascaris infection occurred also, it is stated, in untreated cases. As the totals show the treatment left at least 30 per cent. of the hookworms behind, judged by ovum counts.

C. L.

i. SCOTT (J. Allen). **Host Induced Variation in the Growth Curve of the Dog Hookworm,** *Ancylostoma caninum.—Amer. Jl. Hyg.* 1929. July. Vol. 10. No. 1. pp. 125–139. With 4 text figs. [10 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

ii. ——. **Further Experiments with Physiological Strains of the Dog Hookworm,** *Ancylostoma caninum.—Ibid.* 1930. Jan. Vol. 11. No. 1. pp. 149–158. [6 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

i. Two strains of infective larvae were employed in these experiments, the progeny of *A. caninum* which had lived respectively in a dog and a cat. About 2,000 adults, which were recovered after the larvae had infected cats or dogs, were measured. Each strain infected readily the host species from which it had been obtained, and with difficulty the other host species. Both strains grew considerably more slowly and took longer to reach maturity in cats than in dogs, and in both the final size was smaller in cats than in dogs ; but when a cat strain grew at all in dogs, it appeared to grow as fast and to become as large as did the dog strain in dogs. The difference was then conditioned by the host rather than the parasite.

ii. Further attempts were made to determine what these strains meant. After passing one to three generations in cats the dog strain did not appear to grow up in cats more, or dogs less, readily. In a single experiment the cat strain, after one generation in a dog, showed greater infectivity to dogs and less to cats. Young worms which had completed their last ecdysis were removed from the intestine of killed hosts and fed in gelatine capsules to others. They comprised males of one strain and females of another. The new hosts were later killed at intervals varying between 3 and 21 days. The surviving worms numbered 0 to 69 per cent. of those swallowed. The percentage of 69 was obtained 3 days after transfer, one of 55 seven days after, others of 1, 10 and 0 after 16, 19 and 21 days respectively. It is not stated whether any worms had become fertile from these experimental attempts to obtain a fertile cross between the two strains. They had to be abandoned owing to change in the author's duties.

C. L.

SARLES (Merritt P.). **Quantitative Studies on the Dog and Cat Hookworm,** *Ancylostoma braziliense,* **with Special Emphasis on Age Resistance.**—*Amer. Jl. Hyg.* 1929. Sept. Vol. 10. No. 2. pp. 453–475. With 1 text fig. [34 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

A. braziliense has not been found naturally in the region from which animals were obtained for this work. Dogs and cats were infected, in all but 2 instances, by infective larvae of worms developing in the cat. No difference was discovered in their infectivity to dog and cat. The

first appearance of ova was noted by D.C.F.; they were numbered by duplicate Stoll counts of 1/200 gm. each. The worms themselves were collected at autopsy. Their habitat was predominantly in the upper half of the small intestine where they produced no visible haemorrhage, a contrast to the habitat of *A. caninum* in its lower half with its "bloody intestinal picture." The mean length of infective larvae is 0·656 mm. They were fed to experimental animals in gelatine capsules. Eggs first appeared in kittens or puppies 14 to 16 days after infection, in adult cats in 18 to 25 days. The eggs output reached its maximum in 3 kittens on days 22, 24 and 25 and in three cats on days 24, 34 and 37. In the kittens this maximum output averaged 615 per day for each larva given, and in cats 206. The period after infection during which eggs were passed did not exceed 32 weeks. Judging by 10 cats, the average number of eggs per female worm was 321·5 at about 3 weeks after infection, 2,448 at about 6½ weeks, and 4,244 at about 7½ weeks. The egg output varied, then, with the age of the worms. Males and females were roughly equal in number except with very small infections. In 8 kittens 8·5 to 61·6 per cent. of larvae developed into adults, in 7 cats the numbers were 0 to 20·8. There is then an age resistance to oral infection.

C. L.

i. SARLES (Merritt P.). **The Effect of Age and Size of Infestation on the Egg Production of the Dog Hookworm,** *Ancylostoma caninum.*—*Amer. Jl. Hyg.* 1929. Nov. Vol. 10. No. 3. pp. 658–666. [20 refs.]

ii. ——. **The Length of Life and Rate of Loss of the Dog Hookworm,** *Ancylostoma caninum.*—*Ibid.* pp. 667–682. With 4 text figs. [11 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

i. D.C.F. was used to determine whether dogs were infected. If so they were treated and no infection experiments were carried out "until they had remained negative to repeated D.C.F. examinations for at least two weeks." The egg output was measured by two counts each of 1/200 gm. of faeces in decinormal caustic soda solution (Stoll Hausheer). The worms were obtained from the intestine after killing the dogs. A most important finding is that egg production in *A. caninum* was much less in large infestations than in small ones. Figures for seven natural infestations of unknown age are as follows :—

Worms. Total.	Worms. Females.	Eggs per day per female.
2	1	24,900
3	2	20,500
28	16	26,800
33	20	12,900
37	21	15,900
206	94	7,900
326	187	4,500

Experimental infections showed the same feature. For instance, in a group of dogs with worms 31 days old, one dog with 14 worms (5 females) gave an egg output of 28,400 per female, while one with 174 worms (90 females) gave an output per female of 7,200. With

worms of that age in six dogs with an infection of less than 50 worms each, the daily egg output was 12,900 per female worm; in nine dogs with more than 200 worms the corresponding figure was 4,411. The highest egg output was reached about a month after infection.

ii. The appearance and disappearance of eggs was determined by D.C.F., egg numbers by two counts each of caustic soda suspension corresponding to 1/200 gm. of faeces (Stoll and Hausheer). "Egg counts were not corrected to the basis of formed faeces, as HERRICK found this to be unnecessary in dog hookworm infestations." First infections were by oral administration in double gelatin capsules of approximately 500 larvae of *A. caninum*. Eggs continued to be found for 43 to 84 weeks by the Stoll method and for 43 to 100 weeks by D.C.F. Their quantitative rise and fall are clear from this table, the figures being obtained by Stoll counts.

Weeks after infection.	Dog 79.	Dog 80.	Dog 81.	Dog 82.	Dog 84.
4 ...	23,100	10,300	11,400	17,400	11,900
12 ...	14,300	23,500	10,500	67,300	36,200
28 ...	2,900	7,200	2,500	3,000	2,600
42 ...	3,200	4,400	1,400	1,800	500
50 ...	1,400	1,900	300	0	300

As soon as the first infections had been lost a second was produced by similar means, but the larvae given varied in number from 435 to 9,000 in cases in which they were not vomited. The maximum egg output per larva administered had been 64 eggs per gram for the first infection; it was 0·25 egg per gram for the second. It is pointed out that this does not necessarily mean an immunity acquired as the result of the first infection, since the dogs were older and accordingly less susceptible; in one control dog of aubout the same age, the maximum egg count after swallowing 435 larvae was 3,100 per gram or 7 per gram per larva. The highest output in a second infection was 2,500 after 2,180 larvae or 1 per gm. per larva. Third and fourth attempts at infection with 16,300 to 23,500 larvae all failed to produce infections large enough to count by the Stoll-Hausheer method, though D.C.F. continued to show their presence. In one dog completely refractory to larval infestation by mouth or skin, 57 adult worms given orally by capsule showed sufficient eggs to be counted by the Stoll-Hausheer method for two weeks although D.C.F. recovered them for 17 weeks [and would have counted them with expedition if pushed to finality].

C. L.

SARLES (Merritt P.). **The Reaction and Susceptibility of Dogs of Different Ages to Cutaneous Infection with the Dog Hookworm,** *Ancylostoma caninum.*—*Amer. Jl. Hyg.* 1929. Nov. Vol. 10. No. 3. pp. 683–692. [11 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

"1. In young dogs the penetration of the larvae either produced no local reaction or a very slight and transient one. 2. In old dogs there was an immediate local reaction to the penetration of the larvae, followed by a violent and prolonged inflammation. Sections of the skin showed evidence of the destruction of the hookworm larvae during this process. 3. In young dogs the larvae migrated rapidly from the skin, through the lungs to the intestine, and only a small number were found in the skin later than the

first day after infection. 4. In the old dogs the larvae were retained in large numbers in the skin, although some succeeded in undergoing a delayed migration to the intestine. 5. The percentage development of the larvae following cutaneous infection of young dogs was much less than for oral infection of dogs of the same age. In old dogs the percentage development was very small by both methods, showing the presence of an age resistance. 6. A persistence of undeveloped larvae in the intestines of dogs following cutaneous infecton was noted which substantiates the similar observation of Scott on oral infections."

C. L.

SARLES (Merritt P.). **Studies of the Blood Changes occurring in Young and Old Dogs during Cutaneous and Oral Infection with the Dog Hookworm,** *Ancylostoma caninum.*—*Amer. Jl. Hyg.* 1929. Nov. Vol. 10. No. 3. pp. 693–704. With 4 text figs. [7 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

" Daily blood studies were made on young and old dogs during cutaneous and oral infections with *A. caninum.*

" Both oral and cutaneous infection of adult dogs caused a marked increase in the total number of leucocytes in the blood. There was an immediate decrease in the number of eosinophiles following both oral and cutaneous infection, succeeded by a gradual increase which produced an eosinophilia of 17 to 42 per cent. on the tenth to fourteenth day after infection. This change in the number of eosinophiles in the blood was very constant and similar in the six adult dogs studied.

" In young dogs cutaneous and oral infection failed to produce a marked eosinophilia and a leucocytosis was not a constant occurrence.

" Following cutaneous and oral infections of approximately 20,000 larvae less than 25 worms developed in the intestines of *adult* dogs, and no significant decrease resulted in the grams of hemoglobin or number of red blood corpuscles.

" Cutaneous and oral infections of approximately 10,000 larvae produced in *young* dogs infestations of over 1,000 worms and caused an acute and fatal anemia in the second week after infection."

C. L.

FÜLLEBORN (F.). Durch Hakenwurmlarven des Hundes (*Uncinaria stenocephala*) beim Menschen erzeugte " Creeping Eruption." [**Creeping Eruption produced in Man by the Dog Hookworm.**]—*Abhandl. a.d. Gebiet d. Auslandskunde. Hamburg. Univ.* 1927. Vol. 26 (D., Med. & Vet. Vol. 2). [Festschrift NOCHT.] pp. 121–133. With 23 figs. on 6 plates. [16 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

In these sacrificial experiments, Fülleborn was both priest and victim and induced HERTMANN to share the latter useful but unpleasant role. Mature larvae of *Uncinaria stenocephala* of the dog were applied to the arm with or without scarification. In the case of the younger man (aged 28) there appeared early at the site of the application redness and wheals. On Fülleborn's arm repeated application of many larvae produced no such effect. The scarifications did not heal and a very irritable red and papular infiltration appeared round them. Thirteen days after the application, creeping eruptions began. For 24 hours the newly formed portion of a track was not reddened. Later it became distended and fluid exuded if it were broken. It was concluded that larvae were wandering, and were doing so in the epidermis, since local application of silver nitrate diverted the advancing

line of eruption. To make certain, Fülleborn further sacrificed two portions of his own skin, cut out under ethyl chloride, each 1 to 2 cm. long and 1 cm. broad, and serially sectioned them at a uniform spacing of 10μ. The track was thus reconstructed. It lay quite superficial immediately under the horny layer of the epithelium. At its spreading end it was narrow and was probably filled by the larva before this shrank in preservation. Where it was older it was distended and enlarged by fluid in which might be many leucocytes. The illustrations are excellent. "Heliobrom," silver nitrate and ethyl chloride spray are mentioned in treatment.

C. L.

WHITE (G. F.) & DOVE (W. E.). **A Dermatitis caused by Larvae of** *Ancylostoma caninum.*—*Arch. Dermat. & Syph.* 1929. Aug. Vol. 20. No. 2. pp. 191–200. With 5 text figs. [14 refs.]

Typical ground itch, without creeping eruption, occurred in a human volunteer after infective larvae of *A. caninum* were applied to the skin of the forearm.

C. L.

i. McCOY (Oliver R.). **The Growth of Hookworm Larvae on Pure Cultures of Bacteria.**—Reprinted from *Science.* 1929. Jan. 18. Vol. 69. No. 1777. pp. 74–75. [2 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

ii. ——. **The Suitability of Various Bacteria as Food for Hookworm Larvae.**—*Amer. Jl. Hyg.* 1929. July. Vol. 10. No. 1. pp. 140–156. [14 refs.]

i. By straining, washing, centrifuging and floating in saturated salt solution with looping of the surface ova can be obtained almost entirely free from faecal matter. If "sterilized" with 5 per cent. antiformin or 10 per cent. formalin, 10 to 50 per cent. of ova remain viable. After thorough washing in sterile distilled water such ova are inoculated on to agar cultures. If nothing further is added embryos hatch normally, but do not grow. If then there be added pure cultures of certain bacteria, or if the eggs be placed on these originally, the larvae reach the infective stage, in normal times in the latter case. Such growth occurred in culture of *Bact. coli*, *B. subtilis*, *Eryth. prodigiosus*, *Bact. lactis aerogenes*, *Staphylococcus aureus*, *Vibrio metchnikovii*, *V. rubrum* and *Micrococcus citreus*. There was no development on *Ps. pyocyanea* or *Sarcina lutea*, and but little on *B. cereus* and *B. megatherium*.

ii. Eggs of *A. caninum* cleaned by floating and washing were added, together with pure cultures of 1 of 25 different species of bacteria, to agar. They developed best in *Bact. coli*, *Bact. lactis aerogenes*, *Bact. alcaligenes*, *Bact. cloacae*, *Bact. pneumoniae*, *B. mycoides corallinus*, and *Proteus vulgaris*, the first 3 being 3 of the commonest faecal bacteria. Bacteria freed from agar furnished sufficient food for growth to infectivity to occur; dead bacteria or the filtrate through a Berkfeld filter of normal saline suspensions of *Bact. coli* or *Bact. lactis aerogenes* allowed hatching of larvae but not their development. Autoclaving a mixture of charcoal and faeces, and adding hookworm eggs prove viable by controls, gave no development to infectivity though this took place

when *Bact. coli* were also added. "All the evidence from the experiment indicates that living bacteria constitute the essential food utilized by hookworm larvae in developing to the infective stage."

C. L.

WHITE (G. F.). **A Method for obtaining Infective Nematode Larvae from Cultures.**—*Science.* 1927. Sept. 30. Vol. 66. No. 1709. pp. 302–303. With 1 text fig. [7 refs.]

White describes an apparatus for trapping hookworm larvae as they escape from a culture. It consists of a dish in which the culture is placed, centred within another dish containing water, the whole being covered with a third. [An apparatus with precisely these characters was shown by the abstractor at the laboratory meeting of the Royal Society of Tropical Medicine and Hygiene on March 18th, 1926, and had been then in use by him for some time. Dr. KIRBY-SMITH attended this meeting. Dr. KIRBY-SMITH and Dr. White are collaborators. A year and a half after that meeting this note was published, and it contains the statement that the method described had been employed for a year and a half. Since no mention is made of the original apparatus it is clear that the long arm of coincidence is more active in real life than most novelists would dare to suggest.]

C. L.

PIRIE (J. H. Harvey), RETIEF (F.) & FERGUSON (A. L.). **Specific Skin Reactions in Ankylostomiasis.**—*Proc. Transvaal Mine Med. Officers' Assoc.* 1929. June. Vol. 9. No. 100. pp. 19–20. [2 refs.]

Antigen was prepared by desiccating washed hookworms over concentrated sulphuric acid, powdering, and extracting with Coca's alkaline saline solution under toluol. A drop of this extract was placed on a scarification and the reaction noted half an hour later. "If the results of this test of ours had been used to indicate the necessity for treatment or otherwise, it would have meant that out of the 100 boys, 17 with ankylostome ova in their stools would have been treated; 27 cases showing no ova would also have been treated; and 15 with ova would have escaped treatment." The method of diagnosis is not stated so that no guess can be made as to the number of apparently uninfected who were really so.

C. L.

KAWANISHI (K.). **Experimental Studies on the Entrance of Pathogenic Bacilli incidental to Percutaneous Infection with Hookworm.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1929. Sept. No. 294. [In Japanese. English summary pp. 50–51.] [Govt. Med. College, Taihoku, Formosa.]

According to the English summary, on the surface of ankylostome larvae many bacteria are found; they survive there as long as they do in soil; and are not removed by washing, by passage through agar, or through the skin. Typhoid bacilli were found in various organs of the guineapig within an hour of smearing them and infective larvae on the skin. No bacteria were found within the larvae which possess a bactericidal ferment. [No note in the summary indicates whether larvae were sheathed or unsheathed.]

C. L.

OISO (T.). [**Experimental Studies on Oral Infection with** *Necator americanus*.]—*Taiwan Igakkai Zasshi (Jl. Med. Assoc. Formosa).* 1929. Sept. No. 294. [In Japanese. English summary pp. 52–53.] [Govt. Med. College, Taihoku, Formosa.]

In dogs fed with hookworm larvae pulmonary migration was less vigorous in necator than in *A. duodenale*. In rabbits, guineapigs and mice most larvae were passed dead per rectum but a few reached the lungs.

C. L.

GARIN (Ch.), DOUBROW & MOUNIER. Larves vivantes d'ankylostomes, trouvées dans le fond d'une mine infestée. [**Living Ankylostome Larvae found in an Infested Mine.**]—*Lyon Méd.* 1928. June 3. Vol. 141. No. 23. p. 633. With 2 figs. on 1 plate.

Of the many larvae recovered from a mine one is illustrated by a photomicrograph. The shape of its tail is not that of the hookworm larva.

C. L.

FISCHER (W. O.). Ueber eine Methode zum Abtöten von Hakenwurmlarven im Boden. [**Method of Destruction of Hookworm Larvae in Soil.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Apr. Vol. 32. No. 4. pp. 163–175. With 3 text figs. [Dept. of Sanitation, Rand Mines, Ltd., Johannesburg.]

Fischer demonstrated [as LAMBINET had done more than 20 years earlier] how destructive is salt to eggs and larvae of hookworms.

C. L.

MICHELETTI (Ettore). Intorno ad una nuova specie di anchylostoma. [**A New Species of Ancylostoma.**]—*Ann. di Med. Nav. e Colon.* 1929. Nov.–Dec. Year 35. Vol. 2. No. 5–6. pp. 246–257. With 7 figs. on 1 plate. [7 refs.] [Inst. of Med. Parasit., Univ., Rome.]

Ancylostoma mephitis, n. sp., is described from the skunk *Mephitis zorilla*. All details given appear to apply to all known species of the genus except that *A. mephitis* is described as having on each side only two subventral adoral teeth, the rudimentary inside one of *A. duodenale* not being reported. Its length is: Male 12 mm. to 15 mm., female 15 mm. to 18 mm.

C. L.

REVIEWS AND NOTICES.

SCHILLING (Victor) [Professor Dr., Physician-in-Chief, the First Medical University Clinic, Charité, Berlin]. **The Blood Picture and its Clinical Significance (including Tropical Diseases). A Guidebook on the Microscopy of Blood.** Translated and Edited by R. B. H. GRADWOHL, M.D. Seventh & Eighth Revised Edition.—408 pp. With 44 illustrations & 4 colour plates. 1929. London: H. Kimpton. [42s.]

This book is subdivided into four sections, the first dealing with haematological technique, and the second with the theory, morphology and classification of the blood picture. The third and fourth parts are concerned with the fundamental principles underlying the haemogram and its practical application to clinical work. For reasons that are not obvious a new test known as the guttadiaphot is given considerable prominence in the introductory chapters. In the author's opinion the haemogram, the sedimentation test, the guttadiaphot and the Wassermann reactions supplement each other in a very helpful way.

Schilling believes that platelets arise during the process of denucleation of the primary erythrocyte and holds that nucleated red cells only become pathological when they appear in the peripheral circulation. Emphasis is placed on the fact that the diagnosis of megalocytic anaemia may be made from a study of the blood film but not that of cryptogenetic pernicious anaemia since similar pictures may arise in the course of lues, pregnancy, carcinoma, sprue and dibothriocephalus infestation. No reference is made either to the Price–Jones curve or to other methods of estimating the diameter of red blood corpuscles. The leucocytic blood picture including the usual differential count introduced by ERHLICH is discussed at length. ARNETH observed that in most infections or toxic diseases there is a transformation of the nuclei of neutrophiles from segmented forms to a simple sausage, bean or ball shape and demonstrated that if the neutrophiles were arranged schematically from left to right according to the number of their lobes a shift to the left occurred. On the other hand, in another group of diseases including beri-beri, scurvy, sprue and pernicious anaemia a shift to the right with increase of highly segmented cells was observed. ARNETH demonstrated changes in the entire neutrophile group of cells, but Schilling regards this complex nuclear scheme with its 24 subdivisions as theoretical and denies that the pathological forms in a shift to the left are necessarily young forms. Schilling in his haemogram classifies all the cells with two or more irregular lobes in the nucleus into one group of segmented polymorphs (S) and divides the others into neutrophilic degenerative stab or staff forms (St), regenerative juvenile forms (J) corresponding closely to the metamyelocytes of Pappenheim, and myelocytes (M). While ARNETH takes into account only a juvenile shift to the left, Schilling distinguishes between a regenerative shift on the one hand and a degenerative shift on the other. Regenerative shift is associated with a leucocytosis and is characterized by the appearance of juvenile cells which are not usually present; it represents increased regenerative activity of the bone marrow and is especially characteristic of septic diseases. Degenerative shift is associated with an increase of stab forms and is an expression of defective neutrophile leucopoiesis. It is met with in typhoid, kalaazar, and tuberculosis. The differential count of the neutrophiles is nearly always decreased and the total count diminished except in high grade lymphocytosis. Actually in normal practice most infectious shifts are mixed forms. Normally, the ratio of pathological shift cells (M. + J. + St) to normal cells (S) is 1 : 16 and reasonable variations in this index may be used to estimate the degree of pathological shift in the haemogram.

The Schilling index and haemogram are less cumbersome than Arneth counts, and undoubtedly afford information of considerable practical value. These studies, however, are essentially clinical and would have gained much in value if more pathological evidence regarding the various degenerative and regenerative changes in bone marrow so glibly referred in the text as underlying the various blood pictures had been forthcoming. As a guide to the microscopy of the blood this book cannot be recommended. It has been written from too focal a viewpoint and fails to survey much available haematological data. Furthermore, it is handicapped by an entire absence of reference to all English and American literature dealing with this subject. Mistakes in the text are common and in this and other directions Gradwohl's translation leaves considerable room for improvement in subsequent editions.

N. Hamilton Fairley.

TALIAFERRO (William H.) [Ph.D., Professor of Parasitology the University of Chicago]. **The Immunology of Parasitic Infections.**—pp. xv+414. With 28 figs. The Century Biological Series, Robert Hegner, Editor. 1929. The Century Co., New York: London. [$6.00.]

In the preface the author points out that this work is not intended to be a treatise on immunology, but a compilation and evaluation of the mass of immunological data bearing on infections with animal parasites. The introductory chapter deals with some fundamental concepts of parasitism, infection and immunity. Then follows an important section on biological aids to diagnosis, including a review of the complement fixation, agglutinin and precipitin reactions and various miscellaneous tests.

In Taliaferro's opinion the specific complement fixation reactions reach their highest degree of perfection in hydatid disease and the schistosome infections of man, and in trypanosomiasis of horses, information of the utmost value being afforded. Sporadic studies on malaria and kala azar have elicited no significant specific tests, but the formol-gel reaction in the latter disease receives favourable comment. It is interesting to note that yaws is regarded as the only disease other than syphilis likely to yield positive results with a modern Wassermann technique.

Lysins and reproduction-inhibiting antibodies in malaria and trypanosomiasis are fully considered, as are also the protective and curative action of immune sera in the latter disease. There is an instructive chapter on hypersensitiveness and the various cutaneous tests applicable to helminths, and the opinion is expressed that no field of parasitic immunity offers promise of more interesting practical and theoretical results. Abnormal skin sensitiveness may manifest itself as local anaphylaxis (Arthus phenomenon), as an immediate wheal or as a delayed reaction. The latter appears more frequently in protozoal and bacterial infections, the immediate wheal in infestation with the intestinal worms, while both types occur in hydatid and schistosomiasis. The clinical value of these reactions is discussed but the view that the intradermal test is proving more reliable than the complement fixation reaction in echinococcosis is hardly in accord with recent publications on this subject. Eosinophilia is regarded as being dependant on previous sensitization to foreign protein and the obvious similarity of protein wheals to those arising from the bites of insects is commented on. Evidence is cited showing that these result only in persons previously bitten.

Parasites may exert deleterious effects on the host by the production of endotoxins, exotoxins or protein products. Malarial paroxysms are related to the periodic liberation of foreign protein into the blood stream the symptom complex really being of anaphylactoid origin, while in sarcosporidia a true exotoxin known as sarcocystin is produced.

In the past, the physiology and the immunological study of the animal parasites have been largely sacrificed on the altar of morphology, and in this respect both helminthology and parasitology have lagged far behind their sister science of bacteriology. The need for some authoritative work on parasitic immunology has long been felt by workers in this field of enquiry, and Professor Taliaferro is to be heartily congratulated on having achieved this objective in the limited space of three hundred and eighty-six pages, seventy-five of which are devoted to bibliography.

N. Hamilton Fairley.

CORT (W. W.), STOLL (N. R.), SWEET (W. C.), RILEY (W. A.) & SCHAPIRO (Louis). **Studies on Hookworm, Ascaris and Trichuris in Panama. Embodying the Results of the Researches of an Expedition to the Republic of Panama, May to September, 1926.**—*Amer. Jl. Hyg.* Monographic Series. 1929. Jan. No. 9. pp. vii+215. Ill.

There are discussed the situation in Panama with relation to the hookworm problem; the laboratory methods used which included a Stoll-Hausheer count and a Willis examination for iced stools at the rate of over 200 a week; stool size in its relation to eggs in the faeces; the correction of hookworm rates for age and sex; an analysis of hookworm infestation in areas in Panama uninfluenced by control measures in which reliance on the accepted worm-ovum ratio lead to the conclusion that "the size of the infestations in young children in this area is perfectly extraordinary"; the effect of treatment and sanitation in which is stressed the ineffectiveness of treatment without sanitation, "such methods have long since been abandoned in well organized control programs"; the haemoglobin level as a measure of intensity of hookworm infection, which is believed to hold in some provinces and not in others; the distribution of ascaris and trichuris, which have not been influenced by the introduction of the type of latrine used. [STILES showed long since grave reasons for considering ascaris as a privy-spread disease.]

Clayton Lane.

DE MOOR (Cornelis Ewout). **Het rhinoscleroom, in het bijzonder in de tropen.** [Rhinoscleroma and its Occurrence in the Tropics.]—Academisch Proefschrift. Amsterdam.—pp. xi+159. With 45 figs. on 7 plates & 4 folding tables.

At the outset, in looking through this work, one is struck by its description as a thesis to be defended publicly in the hall of the university of Amsterdam at a given hour and on a given date. This is the usual formula and procedure for doctorate theses. That the defence was well sustained is borne out by the text. Rhinoscleroma is now a well-characterized disease. The first three chapters, which deal with pathological anatomy and clinical appearances, bacteriology and epidemiology, present with very full reference to the literature all the facts known in regard to the disease. Cases found in the Dutch East Indies, and not yet published, formed the occasion for the thesis, which deals in its later chapters with the question of their identity with the well-known European form. The disease itself is one of the infective granulomata, affecting especially the skin or mucous membrane of the nose, but also other parts of the respiratory passages. Tissue lesions are characterized by a dense infiltration with plasma cells and the occurrence of the so-called Mickulicz cells. These have been regarded as enlarged plasma cells, endothelial cells and as macrophages. It is probable that they represent degenerated macrophages of endothelial or connective tissue origin. Much interest centres round the existence in the lesion of a capsulated bacillus, first discovered by v. Frisch. It evidently belongs to the group of organisms of which the pneumobacillus of Friedlaender

forms the type. All the facts for and against the specificity of this bacillus of rhinoscleroma (*Bacterium rhinoscleromatis*) are very fully considered. There seems no doubt about the constancy with which it can be isolated in pure culture; the main subject for discussion is whether it can be regarded as the primary cause or is merely a secondary invader.

Extensive researches of the author into the literature of the distribution of the disease and its epidemiology are contained in the third chapter. The best known and oldest focus is that which covers a considerable area in the east of Europe, but it is probable that it has a very much greater geographical extent than is commonly recognized. The cases occurring in Sumatra are probably only indicative of a better recognition at the present day and more frequent publication. It is a disease especially of poverty-stricken populations. In England there is record of a case shown before the Pathological Society of London in 1885 and of the affection of two sisters (1889) in Newcastle, whose nationality is not given. A very considerable endemic area seems to exist in Central America. North American cases are derived almost entirely from emigrants from East Europe. Tropical Asia possesses a focus in Bengal (Calcutta).

Six cases of rhinoscleroma have been diagnosed on the East Coast of Sumatra since SNIJDERS and STOLL described the first in 1918. The disease probably passes from case to case by contact infection. Two chapters, preceding the final summing up are occupied with the detailed consideration, clinical and bacteriological, of the cases which have occurred in Sumatra. The last short chapter gives the summary and conclusions of the author, which briefly are that the capsulated bacillus of rhinoscleroma is the primary and specific cause of the condition and that rhinoscleroma is much more widely existent in subtropical and tropical regions than is generally realized.

This monograph may be taken as an exceedingly comprehensive and critical treatment of the subject of rhinoscleroma in general and as a well contested disputation on its title to be included among tropical diseases. It is somewhat extraordinary to read that so disfiguring and definite a disease receives no mention in handbooks devoted specially to tropical diseases.

W. F. Harvey.

THOMSON (David) [O.B.E., M.B., Ch.B. (Edin.), D.P.H. (Camb.)] & THOMSON (Robert) [M.B., Ch.B. (Edin.)]. **The Pathogenic Streptococci. Their Rôle in Human and Animal Disease (Continued).**—*Ann. Pickett-Thomson Research Lab.* 1929. Oct. Vol. 5. pp. ix+392. With 1 text fig., 5 charts & 46 plates. London: Baillière, Tindall & Cox. Baltimore: Williams & Wilkins Co. [£2. 2s. 0d.]

This is the fourth successive volume of these Annals dealing with streptococci and the intention of the authors to present, in the end, a complete monograph of the genus will require, we learn, at least two further volumes. It is difficult to say much that is new about the present volume, since it follows precisely on the lines of those which have gone before. It has, in our judgment, the same very definite merits and the same defects; it is published, too, at the same prohibitive price—one which places it out of the reach of that wide circle of laboratory workers for whose benefit we must conceive it to have been written. The authors still exhibit the same easy confidence that the classification of the streptococci can be achieved by the photography of their colonies on Warren Crowe's special blood agar medium, and it must be admitted that, granting this premiss, the photographs which freely illustrate the volume are, if possible, even better than their predecessors.

The practice of the authors is to group the streptococci on the basis of the morbid conditions to which they give rise, and we have in the present

instalment three separate monographs, each of much interest. The first is on oral and dental sepsis, including dental caries, pyorrhoea alveolaris, apical infections and periodontal suppurations. The second monograph deals with the part played by streptococci in tonsillitis and pharyngitif. Scarlet fever is deferred for a future monograph, and the most important subject here dealt with is the relation of haemolytic streptococci to follicular and septic tonsillitis. The last monograph is on a subject at present much in the public eye, name, puerperal sepsis. The overwhelming importance of *Streptococcus pyogenes* in serious puerperal sepsis is well brought out, though the share of other species is not neglected.

[Abridged from review by Sir F. W. Andrewes in *Bulletin of Hygiene*, 1930. Apr. Vol. 5. No. 4. p. 344.]

HELLERSTRÖM (Sven). **A Contribution to the Knowledge of Lymphogranuloma Inguinale.**—*Acta Dermato-Venereologica.* Stockholm, 1929. Supplement I. 224 pp. With 7 colour-photographs & 9 microphotographs in black & white.

The title of this work hardly gives a correct conception of what is in reality a monograph on a disease which has recently attracted much attention in all countries. The disease is one for which many names have been suggested and the author has selected that one which he considers least open to criticism. Quite a large literature has grown up in the last few years dealing with this affection in European countries and elsewhere outside the tropics from the pens of observers who were probably unfamiliar with the condition known to practitioners in warm countries as climatic bubo and it is only quite recently that the two have been recognized as one and the same morbid entity. This is very well shown in the author's full historical survey in which he also shows that the growing literature speaks not only for wider recognition of the disease but for a wider distribution than formerly. The final proof of the unity of the two conditions, short of finding a single specific organism in both, the author finds in the results of crossed intra-cutaneous tests. He has been unable to confirm some other observers in finding a specific virus.

Hellerström's clinical and pathological findings are in conformity with those of others but the full notes of 48 cases (80 pages) form a valuable contribution to the subject. He advocates early complete enucleation of the affected glands as routine treatment but it is a little disappointing to find that no trial was made of intravenous non-specific shock therapy—T.A.B. vaccine. In conclusion one would like to welcome this volume from Stockholm written in English with French and German summaries and draw attention to the very beautiful coloured photographs.

H. S. Stannus.

BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION. **The Fight against Leprosy. Being the Annual Report for 1929.**—44 pp. With 8 figs. & 1 map. London: 29, Dorset Square, N.W.1.

The annual report for 1929 of the British Empire Leprosy Relief Association forms an attractive booklet. The Association was formed to give every leper the opportunity of treatment and to devise a system which would result in the control and ultimate eradication of leprosy from all parts of the King's dominions. It promotes the establishment of branches in British possessions where leprosy is rife, assists them financially as far as its funds permit, supplies them with curative drugs and with seeds of the trees which produce the curative oils, and with books and pamphlets, such as the Summaries of Recent Work published in this *Bulletin*. In the year under review £722 were spent on drugs and £387 on literature,

while the financial grants amounted to £3,725. Its Secretary, now Dr. COCHRANE, stimulates Governments by personal visits. A list of the branches at home and abroad, with the office-bearers, is given. The accounts show that whereas £6,756 was received from various sources, the Association spent £7,936, an excess of £1,180. There is, therefore, a call for more subscriptions, but it may be suggested that Colonial Governments might do more, for while private subscriptions from Great Britain amounted to £1,846 the grants from Colonial Governments (5) only reached £375.

A. G. B.

BANERJI (Paresh). **Handbook of Snake-Bite.**—pp. xvii+430. With 20 plates (12 coloured). 1929. Published by P. Banerji, Mihijam (India). [Rs.10. (16s. 6d.)].

Out of 428 pages, 68 contain a certain amount of more or less correct information about poisonous snakes and the effects of snake-bite. The list of snakes as geographically distributed is taken from BOULENGER (1890). Some of the coloured plates by S. DAS are quite good. The rest of the book is devoted to the fervent advertisement of "Lexin," "a medicine invented by the writer and believed by him to be the real specific for snake poisoning." Experiments made on dogs and guineapigs failed because they could not be made to inhale the drug properly. The so-called case reports tell us that a cow was cured (349) when Lexin was poured into its nostrils and also that an infant too young to inhale was cured of snake-bite by rubbing Lexin into the skin. Many of these case reports—1,134 in number—are obviously worthless, as no snake was seen and there is no evidence of actual snake-bite; in many the name of a snake is given. Again some of these case reports refer not to snakes, but to scorpions and centipedes. One is a letter from a woman saying she has sold so many bottles of Lexin and wants more! A full description of Lexin and its chemical virtues is given in Chapter 1. Lexin is composed of: rectified spirit, HCl; sublimate camphor; trichloride of gold, pyoktanin, and the hydrochlorides of penta and hexa-methyl-para-amido rosanilines.

Anti-venin sera and other remedies are mentioned in the book, but not with any enthusiasm!

We will end with a quotation from the single page which is given to non-poisonous snakes:—

"Ticks from a venomous snake come to live in the body of a non-venomous one and infect the latter, and after a certain length of time the saliva of the snake becomes toxic on account of the presence of the new arrivals."

J. H. Tull Walsh.

NETHERLANDS INDIES MEDICAL AND SANITARY SERVICE [Edited by]. **Control of Endemic Diseases in the Netherlands Indies.**—77 pp. With 3 folding maps, 29 photos & 10 figs. 1929. Landsdrukkerij-Weltevreden.

It is impossible to give in a short review an adequate account of the contents of this book, which sets out the measures in active employment in the Dutch East Indies for the control of the common bacterial and parasitic diseases of the tropics. The Dutch medical staff have satisfied themselves that only educational methods can succeed in combating hookworm disease and that the sound plan is to use such methods alone, unaccompanied by an intensive latrine-building and treatment campaign. An interesting note is given regarding two neighbouring districts. "In the one it was done on a grand scale, was instituted in many place simultaneously, and the full

co-operation of the Government officials, both European and native, was obtained so that, after a large number of lectures and in a short time more than 150,000 people were treated and 40,000 new latrines were built to conform to the conditions laid down. A law, providing for the punishment of those polluting the water and the ground, was also considered. In the other residency the administration also rendered all possible assistance, but here, at the urgent request of the regional Government physician, under whose supervision the service worked there, everybody refrained from exerting pressure of any kind. If the people did not do it of their own accord it was not appreciated. The results in this district were, in proportion, very poor. The number of people treated and especially the number of newly constructed latrines was, in any case, considerably less.

"On the occasion of an inspection at a later date it was found that all the model latrines had remained unused and that the apparently wonderful success had, in reality, not been achieved at all. In the other residency, where the activities had been patiently limited to a few dessas, the confidence of the people had finally been won and the latrines which were built were used exclusively, for the simple reason that the people realised the necessity for them. It went even so far, that the teachings were spread further by the inhabitants themselves, and in neighbouring villages, where the service had not yet been active, the inhabitants were already busy putting the recommendations into effect, of their own accord."

J. F. C. H.

FRANCHINI (Giuseppe). **Rapporto sul funzionamento della scuola di patologia coloniale. Anno Scolastico 1928-1929.** [Report on the Work of the Tropical School, 1928–29.]—87 pp. With 60 figs., 4 maps & 2 plates. 1930. Bologna: Tipografia Paolo Neri.

This report on the work of the Tropical School of the University of Bologna during the year 1928–29 is divided into five parts. In the first is given a sketch of the course in tropical medicine and surgery and in the various special branches, protozoology, helminthology, entomology, etc., for the Diploma of Specialist in Colonial Medicine. This course extends over a longer period than those of the British schools, namely, November to the end of June, following which the examination takes place. There is also a shorter course of four to five months for missionaries and colonial nurses. Part II briefly enumerates the subjects which have been specially investigated during the year, but little in the way of detail is presented, presumably because these are published separately in different periodicals as listed in Part III. Subjects studied have been: (1) Undulant fever and Epizootic abortion; (2) The transmission of Leprosy to monkeys (*M. sinicus*; (3) Investigation into the prevalence of Amoebiasis in Bologna, and animal experiments in connexion with malarial parasites, entamoeba, leishmania and spirochaetes, and a study of intestinal flagellates, ciliates and helminths.

A list giving the number of routine examinations is appended. Several of the publications mentioned in Part III are those of Professor Franchini on the distribution of Ticks in the Italian Colonies. These have already received notice in the *Bulletin*.

Part IV consists of brief accounts of Tripolitania, Cyrenaica, Eritrea, Somali, and the Italian Aegean islands, with good reproductions of photographs illustrative of the country, the hospitals, some special cases and suchlike matters of interest. The publication terminates with a list of those who have obtained the Diploma since 1925. The School clearly does good work, not only in training men for service in the tropics, but in assisting those already practising there by examining material sent in and by keeping in touch with the Colonies; it maintains relations with other tropical institutions and is to be congratulated on a year of good work.

H. Harold Scott.

BEIHEFTE ZUM ARCHIV FÜR SCHIFFS- UND TROPEN-HYGIENE. 1929. Vol. 33. No. 3. pp. 5–287 (89–371). With 35 text figs. & 1 plate. **Verhandlungen der Deutschen Tropenmedizinischen Gesellschaft. Neunte Tagung vom 12.-14. September 1929 zu Tübingen.** [Proceedings of the 9th Meeting of the German Tropical Society held at Tübingen, September 12–14, 1929.]

This Beiheft contains the proceedings of the 9th meeting of the German Tropical Society held in 1929 at Tübingen at the invitation of Professor OLPP of the Institut für ärztliche Mission. There were 87 participants. A short account of the meeting, two pages of revised laws, and a list of members with office-bearers is succeeded by 36 papers, most of which will be noticed in this *Bulletin* in their appropriate place. They concern malaria, leishmaniasis, yellow fever, trypanosomiasis, helminthiasis, amoebiasis, plague, climatic bubo, undulant fever and other subjects. The number is well produced, with stiff covers.

A. G. B.